Vol. 913 Number 2

OFFICIAL GAZETTE

of the

UNITED STATES PATENT OFFICE

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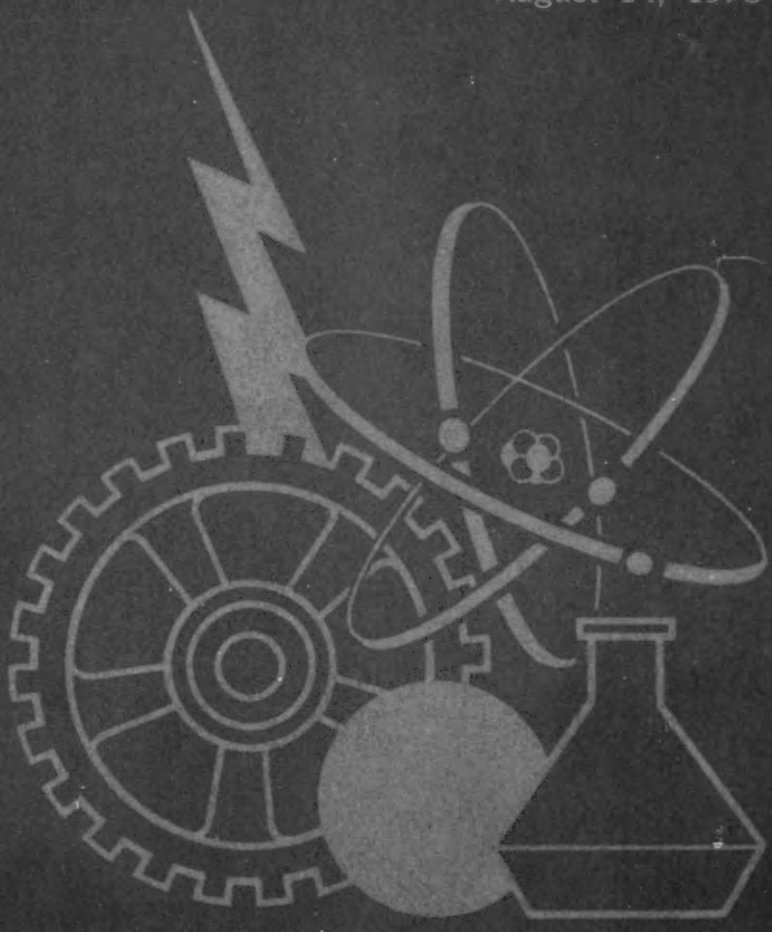
PATENTS

August 14, 1973



U. S. DEPARTMENT OF COMMERCE

Patent Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

August 14, 1973 Volume 913 Number 2

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PATENT NOTICES

Dedication

3,382,280.—*Clarence W. Huffman*, Glenview, Ill. 3',4'-DICHLOROPROPIONANILIDE. Patent dated May 7, 1968. Dedication filed Feb. 5, 1973, by the assignee, *Monsanto Company*.

Hereby dedicates to the Public the entire term of said patent.

Disclaimers

3,565,904.—*Peter Frederick Juby*, De Witt, *Richard Anthony Partyka*, Liverpool, and *Thomas William Hudyma*, De Witt, N.Y. 1,2,3,4 - TETRAHYDRO - 1 - NAPHTHOIC ACIDS. Patent dated Feb. 23, 1971. Disclaimer filed Apr. 2, 1973, by the assignee, *Bristol-Myers Company*.

Hereby enters this disclaimer to claims 9 and 18 of said patent.

3,676,224.—*Charles Thomas Snee*, Willoughby, Ohio. PHOSPHATING SOLUTION WITH SCALE SUPPRESSING CHARACTERISTICS. Patent dated July 11, 1972. Disclaimer filed July 24, 1973, by the assignee, *The Lubrizol Corporation*.

Hereby disclaims the portion of the term of the patent subsequent to Aug. 3, 1988.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability

The inventions listed below are owned by the U.S. Government and are available for licensing in accordance with the GSA Patent Licensing Regulations.

Copies of patent applications, either paper copy (PC) or microfiche (MF) can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22151, at the prices cited. Requests for copies of patent applications must include the patent application number and the title. Requests for licensing information should be directed to the address cited with each copy of the patent application.

Paper copies of patents cannot be purchased from NTIS but are available from the Commissioner of Patents, Washington, D.C. 20231, at $0.50 each. Requests for licensing information should be directed to the address cited below for each agency.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF COMMERCE

Assistant General Counsel for Administration, Washington, D.C. 20230

Patent 3,354,411. Coaxial Transmission Line T-Junction Having Rectangular Passageway Dimensioned Beyond Cutoff for Higher Order Modes. Filed Oct. 22, 1965. Patented Nov. 21, 1967. Not available NTIS.

Patent 3,586,973. Standard Field Strength Meter. Filed Dec. 15, 1969. Patented June 22, 1971. Not available NTIS.

Patent 3,609,541. Radio Frequency Coaxial Ammeter With Thermal Compensation. Filed Jan. 20, 1970. Patented Sept. 28, 1971. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR

Branch of Patents, 18th and C Sts. NW., Washington, D.C. 20240

Patent application 206,793. Method for Making a Hollow Fiber Separatory Element. Filed Dec. 10, 1971. PC $3/MF $1.45.

Patent 3,725,268. Softening of Sea Water by Addition of Barium Carbonate and Mineral Acid. Filed Feb. 14, 1972. Patented Apr. 3, 1973. Not available NTIS.

Patent 3,725,267. Softening of Sea Water by Addition of Barium Carbonate and CO_2. Filed Feb. 14, 1972. Patented Apr. 3, 1973. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters, NASA—Code GP–2, Washington, D.C. 20546

Patent application 354,611. Chromato-Fluorographic Drug Detector. Filed Apr. 25, 1973. PC $3/MF $1.45.

Patent application 192,803. Scan Converting Video Tape Recorder. Filed Oct. 27, 1971. PC $3.25/MF $1.45.

Patent application 284,245. Banded Transformer Cores and a Method and Device for Providing the Same. Filed Aug. 28, 1972. PC $3.50/MF $1.45.

Patent application 354,407. Means for Accommodating Large Overstrain in Lead Wires. Filed Apr. 25, 1973. PC $3/MF $1.45.

Patent application 354,612. Fault-Tolerant Clock Apparatus. Filed Apr. 24, 1973. PC $3.25/MF $1.45.

Patent application 354,408. Instrumentation for Measurement of Aircraft Noise and Sonic Boom. Filed Apr. 25, 1973. PC $3/MF $1.45.

Patent application 356,554. Insulation Foil and Method of Making. Filed May 2, 1973. PC $3/MF $1.45.

Patent application 356,555. Latching Device. Filed May 2, 1973. PC $3/MF $1.45.

Patent application 357,312. Improved Coatings for Refractory Metals. Filed May 4, 1973. PC $3/MF $1.45.

Patent application 354,060. Electronic Optical Transfer Function Analyzer. Filed Apr. 24, 1973. PC $3/MF $1.45.

Patent application 352,381. Dished Ion Thruster Grids. Filed Apr. 18, 1973. PC $3/MF $1.45.

[FR Doc. 73–15085; Filed 7–24–73; 8:45 am]

Certificates of Correction for the Week of Aug. 14, 1973

D. 226,556	3,681,332	3,700,660	3,711,553
3,305,520	3,681,735	3,700,852	3,711,618
3,418,263	3,682,628	3,700,967	3,711,807
3,442,536	3,682,901	3,701,317	3,711,962
3,518,880	3,682,966	3,701,658	3,712,184
3,561,052	3,683,081	3,701,659	3,712,358
3,561,875	3,683,767	3,701,782	3,712,378
3,568,909	3,684,166	3,702,143	3,712,869
3,577,244	3,684,170	3,702,287	3,712,873
3,577,982	3,684,330	3,702,983	3,712,901
3,578,703	3,684,443	3,703,527	3,712,903
3,582,809	3,684,468	3,704,291	3,712,920
3,593,598	3,684,782	3,704,760	3,713,004
3,597,087	3,685,046	3,705,063	3,713,140
3,597,571	3,685,171	3,705,741	3,713,768
3,606,078	3,685,625	3,705,928	3,714,104
3,607,909	3,686,293	3,706,475	3,714,268
3,609,332	3,687,671	3,706,749	3,714,367
3,609,356	3,688,284	3,706,916	3,714,465
3,615,417	3,689,012	3,707,114	3,714,471
3,615,467	3,689,360	3,707,208	3,714,639
3,615,516	3,690,837	3,707,316	3,714,675
3,627,523	3,691,065	3,707,366	3,714,759
3,636,431	3,691,152	3,707,478	3,714,867
3,639,331	3,691,199	3,707,518	3,714,924
3,644,355	3,691,372	3,707,569	3,714,995
3,644,682	3,691,553	3,707,608	3,715,130
3,645,726	3,692,546	3,708,534	3,715,558
3,646,066	3,692,643	3,708,590	3,715,668
3,646,647	3,692,773	3,708,606	3,716,100
3,649,411	3,693,489	3,708,613	3,716,511
3,652,518	3,693,581	3,708,614	3,716,530
3,657,353	3,694,465	3,708,662	3,716,579
3,658,775	3,694,707	3,708,789	3,716,643
3,659,323	3,695,925	3,709,025	3,716,829
3,659,885	3,695,933	3,709,306	3,716,888
3,661,841	3,696,108	3,709,602	3,716,997
3,662,184	3,696,117	3,709,796	3,717,069
3,666,707	3,696,795	3,709,850	3,717,222
3,666,713	3,697,546	3,709,968	3,717,318
3,666,983	3,697,578	3,710,127	3,717,324
3,669,829	3,698,337	3,710,526	3,717,409
3,671,487	3,698,701	3,710,737	3,717,654
3,672,049	3,699,026	3,710,780	3,717,671
3,673,246	3,699,298	3,711,132	3,717,708
3,674,048	3,699,306	3,711,374	3,717,959
3,676,271	3,699,498	3,711,444	3,718,228
3,678,355	3,699,511	3,711,492	3,718,333

Certificates of Correction—Continued

3,718,517	3,720,805	3,723,602	3,725,440
3,718,560	3,720,837	3,723,606	3,725,693
3,718,567	3,720,857	3,723,715	3,725,700
3,718,603	3,721,174	3,723,759	3,725,801
3,718,639	3,721,334	3,733,770	3,725,826
3,718,643	3,721,525	3,723,778	3,725,830
3,718,711	3,721,554	3,723,797	3,726,100
3,718,780	3,721,583	3,723,930	3,726,312
3,718,811	3,721,631	3,724,094	3,726,546
3,718,885	3,721,637	3,724,181	3,726,552
3,718,918	3,721,795	3,724,208	3,726,671
3,719,111	3,721,871	3,724,269	3,726,672
3,719,367	3,721,907	3,724,275	3,726,682
9,719,371	3,721,958	3,724,416	3,726,742
3,719,411	3,722,123	3,724,625	3,726,841
3,719,506	3,722,209	3,724,718	3,726,881
3,719,567	3,722,326	3,724,801	3,726,906
3,719,616	3,722,431	3,724,804	3,727,147
3,719,669	3,722,486	3,724,819	3,727,151
3,719,748	3,722,638	3,724,821	3,727,299
3,719,996	3,722,880	3,724,957	3,727,376
3,720,065	3,722,881	3,724,989	3,727,566
3,720,092	3,722,918	3,725,000	3,727,737
3,720,148	3,722,957	3,725,079	3,727,935
3,720,262	3,722,999	3,725,099	3,728,025
3,720,456	3,723,077	3,725,105	3,728,038
3,720,458	3,723,169	3,725,116	3,728,216
3,720,554	3,723,200	3,725,238	3,728,669
3,720,712	3,723,221	3,725,262	
3,720,731	3,723,259	3,725,306	
3,720,763	3,723,355	3,725,380	

Patents Available for Licensing or Sale

2,970,783. COMPOSITE WEARING PARTS FOR CRUSHERS AND THE LIKE. A. H. Plyer, 55 E. Monroe, Chicago, Ill., 60603.

2,995,619. SYSTEM OF TELEVISION TRANSMISSION AND PHOTOGRAPHIC REPRODUCTION OF THE TELEVISED IMAGE. Samuel Freeman, 13 Birchwood Court East, Syosset, N.Y., 11791.

3,007,661. FISHING ROD HOLDER. Mrs. Walter E. Knopf, 1015 SW. 16th St., Lincoln City, Oreg., 97367.

3,263,535. CLAMPING PLIERS HAVING THREE JAWS, TWO OF WHICH ARE CONNECTED BY LEVERS TO THE HANDLE MEMBERS. Erwin Zurcher, Switzerland. Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,461,803. UNDERGROUND PUMPING STATION. Wm. Stothoff Co., Inc., P.O. Box 68, Flemington, N.J., 08822.

3,474,799. TOOTH SPACE DENTAL FLOSS HOLDER CLEANER. Vito P. Capello, 1047 Franklin St., Santa Monica, Calif., 90403.

3,556,581. FOLDING CAMPING TRAILER. Correspondence to: A. W. Breiner, P.O. Box 2728, 727 23rd St. S., Arlington, Va., 22202.

3,586,371. SEATING ARRANGEMENT. Rudolf Baresel-Bofinger, Germany. Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,604,418. APPARATUS FOR STRIPPING FLUID FROM FLEXIBLE PLASTIC TUBING. Y. C. Jones, Gulfport, Mississippi. Correspondence to: L. S. Van Landingham, 10726 Stanmore Drive, Potomac, Md., 20854.

3,614,968. APPARATUS FOR SLICING LUMBER. John R. Hirz, 1233 S. Boyden, Mount Collins, Colo., 80521.

3,652,997. CONTROL SYSTEM FOR MULTIPLE SIGNAL CHANNELS. Ralph G. Cromleigh, P.O. Box 751, La Canada, Calif., 91011.

3,667,844. MULTIPLE MASKING ATTACHMENT FOR PHOTO EASEL. Lloyd W. Pittman, Correspondence to: Richard G. Heywood, Haverstock & Heywood, 611 Olive St., St. Louis, Mo., 63101.

3,687,061. METHOD AND DEVICE FOR BUILDING UP AND REMOVING A FLAT MASS OF GOODS. Alfred Eggenmuller et al., Correspondence to: David G. Boutell, 2026 Rambling Road, Kalamazoo, Mich., 49001.

3,720,100. APPARATUS FOR THE MEASUREMENT OF TENSILE STRESSES ON BANDS, FILAMENTS OR THE LIKE. Indur Power Transmission Ltd., Switzerland. Correspondence to Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,727,118. CONTACTLESS REVERSIBLE DEVICE IN AN ELECTRIC CAR. Nippon Gijutsu Boeki Co., Ltd., 32F Kasumigaseki Bldg., 2-5 Kasumigaseki 3-chome, Chiyoda-ku, Tokyo 100, Japan.

3,733,985. CAMERA FILM IMAGING DEVICE. Lester Gordon, 10 Louise St., Lewiston, Maine.

3,734,047. DETACHABLE DINGHY OR TENDER FOR SAIL BOATS. J. R. Burton, Seabrook, Md. Correspondence to: Sherman Levy, Suite 635, Washington Bldg., 15th and New York Ave. NW., Washington, D.C., 20005.

3,735,428. COMBINATION TOILET AND URINAL. Carlo F. Olivero, 66 Saunder St., Dalzell, Ill. 61320.

3,736,614. ABRADING DEVICE FOR ATTACHMENT TO ELECTRIC KNIFE DRIVE. Sharon Crostic, 1423 Twin Oaks Drive, Arnold, Mo., 63010.

The following 2 patents are offered by: Cecil J. Krow, P.O. Box 264, Ralston, Okla., 74650.

3,509,403. REMOVABLE RENEWABLE ELECTRODE SPARK PLUG.

3,725,715. .090 INCH FIRE SPARK PLUG.

General Electric Company is prepared to grant non-exclusive licenses under the following 10 patents upon reasonable terms to domestic manufacturers.

Application for license may be addressed to: Division Patent Counsel, Switchgear Equipment Business Div., General Electric Co., 6901 Elmwood Ave., Philadelphia, Pa., 19142.

Re. 27,440. SEMICONDUCTOR RECTIFIER WITH IMPROVED TURN-ON AND TURN-OFF CHARACTERISTICS.

3,673,503. HARMONIC SUPPRESSION CIRCUIT.

3,723,859. TESTING APPARATUS HAVING IMPROVED MEANS FOR MEASURING PERMEABILITY AND SPECIFIC LOSS IN A MOVING STRIP OF METAL.

3,725,778. TESTING APPARATUS HAVING IMPROVED MEANS FOR MAINTAINING A CONSTANT DENSITY OF MAGNETIC FLUX INDUCED IN A MOVING STRIP OF METAL.

Applications for license under the following 6 patents may be addressed to: Patent Counsel LSRG-I & MT Divisions, General Electric Co., 1 River Road, Bldg. No. 43, Schenectady, N.Y., 12305.

3,619,076. LIQUID-COOLED TURBINE BUCKET.

3,658,439. METERING OF LIQUID COOLANT IN OPEN-CIRCUIT LIQUID-COOLED GAS TURBINES.

3,678,987. ELASTOMERIC MOLD LINING FOR MAKING WAX REPLICA OF COMPLEX PART TO BE CAST.

3,693,347. STEAM INJECTION IN GAS TURBINES HAVING FIXED GEOMETRY COMPONENTS.

3,722,624. BEARING SEAL AND OIL TANK VENTILATING SYSTEM.

3,728,306. COMPOSITIONS.

Eastman Kodak Company announces that non-exclusive licenses are available to responsible applicants under the following 27 patents.

Applications for licenses may be addressed to: Director, Patent Department, Eastman Kodak Company, 343 State St., Rochester, N.Y., 14650.

3,402,006. MOTION PICTURE PROJECTOR.

3,402,007. FILM FEEDING MECHANISM.

3,493,381. HALFTONE SCREEN HAVING MORE THAN ONE TYPE OF DOT.

3,514,196. MOTION PICTURE PROJECTOR.

3,536,388. MOTION-PICTURE PROJECTOR GATE SYSTEM FOR ACCOMMODATING MULTIPLE FILM FORMATS.

3,537,106. MOTION PICTURE PROJECTOR GATE SYSTEM FOR ACCOMMODATING MULTIPLE FILM FORMATS.

3,542,306. CARTRIDGE FOR ROLL OF WEB MATERIAL.

3,545,970. PHOTOGRAPHIC PROCESSES UTILIZING SILOXANE WATER SPOTTING INHIBITORS.

3,550,881. MANUALLY OPERATED FILM STRIPPER MECHANISM.

3,551,038. SINGLE-POINT LATCH AND INTERLOCK FOR A CARTRIDGE LOADED MOTION PICTURE PROJECTOR.

3,554,748. SILVER HALIDE NUCLEATING COMPOSITION CONTAINING IONIC BORON HYDRIDES.

3,556,435. FILM-THREADING APPARATUS.

3,584,943. SELF-THREADING MOTION PICTURE PROJECTOR OR THE LIKE.

3,628,749. AUTOMATIC FILM THREADING DEVICE.

3,628,751. AUTOMATIC FILM THREADING DEVICE.

3,647,449. NEUTRALIZING BATH FOR USE IN PHOTOGRAPHIC PROCESSING.

3,661,063. MECHANISM FOR SENSING THE CONDITION OF A PERCUSSIVE FLASH DEVICE FOR EFFECTING SYNCHRONOUS PERCUSSIVE FLASH EXPOSURES.

3,672,813. ADAPTER FOR IGNITING ELECTRICALLY IGNITABLE FLASHLAMPS.

3,675,565. PHOTOGRAPHIC APPARATUS.

3,677,156. SIMPLIFIED SYNCHRONIZING MECHANISM FOR CAMERAS ADAPTED TO USE MECHANICALLY FIRED FLASH LAMPS.

3,677,157. CONTROL SIGNAL AND ACTUATING MECHANISM FOR USE WITH PHOTOFLASH LAMP UNITS HAVING PRE-ENERGIZED STRIKERS.

3,677,158. MECHANISM FOR SYNCHRONIZING OPERATION OF A CAMERA SHUTTER AND A MECHANICALLY ACTUATED FLASH DEVICE.

3,677,163. METHOD AND APPARATUS FOR PROCESSING PHOTOGRAPHIC FILM.

3,687,033. MECHANISM FOR OPERATING A CAMERA SHUTTER AND A MECHANICALLY OPERABLE FLASH DEVICE IN SYNCHRONISM.

3,690,236. SYNCHRONIZING MECHANISM FOR PHOTOGRAPHIC CAMERAS ADAPTED TO USE MECHANICALLY FIRED FLASH LAMPS.

3,706,265. PHOTOGRAPHIC APPARATUS FOR FIRING A PLURALITY OF FLASH LAMPS.

3,715,960. CAMERA MECHANISM ADAPTED TO FIRE MECHANICALLY-ACTUABLE FLASH UNITS.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the following 40 patents.

Inquiries respecting licenses under RCA patents should be addressed to: RCA Corporation, Staff Vice President, Domestic Licensing, 1133 Avenue of the Americas, New York, N.Y., 10036.

3,737,345. PROTECTED THERMOELECTRIC ELEMENTS AND METHOD OF PROTECTING SAME.

3,737,682. TRIGGERED FLIP-FLOP.

3,737,706. NUMERICAL DISPLAY DEVICE HAVING FILAMENTARY LIGHT SOURCES.

3,737,715. BISTABLE STORAGE DEVICE AND METHOD OF OPERATION UTILIZING A STORAGE TARGET EXHIBITING ELECTRICAL BREAKDOWN.

3,737,797. DIFFERENTIAL AMPLIFIER.

3,738,880. METHOD OF MAKING A SEMICONDUCTOR DEVICE.

3,739,193. LOGIC CIRCUIT.

3,739,235. TRANSCALENT SEMICONDUCTOR DEVICE.

3,739,297. SINGLE BORE TUBE GAS LASER.

3,739,388. ANTENNA STRUCTURES.

3,739,818. WIRE STRIPPING APPARATUS AND METHOD.

3,739,969. RECORDING WEB TRANSPORT APPARATUS.

3,740,110. FABRICATION METHOD FOR GAS LASERS HAVING INTEGRAL MIRRORS.

3,740,111. HOLOGRAPHIC RECOPDING SYSTEM FOR LARGE OBJECTS.

3,740,261. MODIFIED CZOCHRALSKI GROWN SPINEL SUBSTRATE BY SOLID STATE DIFFUSION.

3,740,280. METHOD OF MAKING SEMICONDUCTOR DEVICE.

3,740,342. METHOD FOR SEPARATING CHEMICALLY-OXIDIZABLE PHOSPHOR PARTICLES FROM MIXTURES WITH ESSENTIALLY NONOXIDIZABLE PHOSPHOR PARTICLES.

3,740,453. ADAPTER FOR COAXIAL CABLE CONNECTOR.

3,740,456. ELECTRONIC SIGNAL PROCESSING CIRCUIT.

3,740,461. DETECTOR CIRCUITS WITH SELF-REFERENCED BIAS.

3,740,462. AUTOMATIC CHROMA GAIN CONTROL SYSTEM.

3,740,465. TELEVISION FRAME STORAGE APPARATUS.

3,740,472. WIDTH CONTROL CIRCUIT FOR A TELEVISION RECEIVER.

3,740,474. VOLTAGE SUPPLIES.

3,740,489. HORIZONTAL OSCILLATOR CONTROL FOR PLURAL OPERATING MODE TELEVISION RECEIVERS.

3,740,582. POWER CONTROL SYSTEM EMPLOYING PIEZO-FERROELECTRIC DEVICES.

3,740,621. TRANSISTOR EMPLOYING VARIABLE RESISTANCE BALLASTING MEANS DEPENDENT ON THE MAGNITUDE OF THE EMITTER CURRENT.

3,740,622. ELECTROLUMINESCENT SEMICONDUCTOR DEVICE FOR GENERATING ULTRA VIOLET RADIATION.

3,740,639. TRANSFORMER COUPLED SWITCHING REGULATOR.

3,740,669. M-ARY FSK DIGITAL MODULATOR.

3,740,672. SEMICONDUCTOR CARRIER FOR MICROWAVE APPLICATIONS.

3,740,693. BUS BAR WITH INTEGRAL TERMINALS.

3,740,717. LIQUID CRYSTAL DISPLAY.

3,741,825. METHOD OF DEPOSITING AN EPITAXIAL SEMICONDUCTOR LAYER FROM THE LIQUID PHASE.

3,742,126. AMPLITUDE CONTROL CIRCUITS.

3,742,248. FREQUENCY DIVIDER.

3,742,337. PROTECTIVE SWITCHING CIRCUIT FOR PROVIDING POWER TO A LOAD FROM AN ALTERNATING CURRENT SOURCE HAVING PEAK-TO-PEAK EXCURSIONS WITHIN OR ABOVE A GIVEN RANGE.

3,742,376. VIDEO AMPLIFIERS.

3,742,392. SELF LOADED UNEVEN POWER DIVIDER.

3,742,464. ELECTRICALLY AND OPTICALLY ACCESSIBLE MEMORY.

PATENT EXAMINING CORPS

WILLIAM FELDMAN, Acting Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 21, 1973

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-30-72
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	8-01-72
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Acting Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	7-03-72
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	5-24-72
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	3-06-72
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	12-13-72
SPECIAL LAWS ADMINISTRATION, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	11-02-72
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	10-02-72
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—L. FORMAN, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	2-23-72
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-13-72
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	11-17-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. BUCHLER, Acting Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	10-02-72
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus: Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	7-03-72
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	10-16-72
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	9-15-72
MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	8-14-72

Expiration of patents: The patents within the range of numbers indicated below expire during August 1973, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,757,378 to 2,761,141, inclusive
Plant Patents..... Numbers 1,505 to 1,508, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED AUGUST 14, 1973

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent Office makes no assertion as to the novelty of the disclosed subject matter.

T913,001
PROCESS FOR THE PREPARATION OF 2-STYRYLBENZOXAZOLES AND 2 - STYRYLBENZOTHIAZOLES

Robert D. Burpitt, 1405 Van Oaks Drive 37665, and Robert H. Hasek, 4503 Mitchell Road 37664, both of Kingsport, Tenn.

Filed Apr. 17, 1972, Ser. No. 244,936
Int. Cl. C07d *85/48*
U.S. Cl. 260—240 D
No Drawing. 9 Pages Specification

This invention relates to a process for the preparation of 2-styrylbenzoxazoles and 2-styrylbenzothiazoles by the condensation of a 2-methylbenzoxazole or 2-methylbenzothiazole with an aryl aldehyde or thienyl aldehyde in the presence of a catalyst system comprising a sulfonic acid and an N-alkylpyrrolidone.

T913,002
FRICTION-WELDED BOTTOM SEALS ON THERMOPLASTIC BOTTLES

Keith Stewart Carmichael, 8 Janice Drive, Beverly Woods, Wilmington, Del. 19803

Continuation of abandoned application Ser. No. 57,679, July 23, 1970. This application May 22, 1972, Ser. No. 255,843
Int. Cl. B29c *27/08*
U.S. Cl. 264—68
1 Sheet Drawing. 10 Pages Specification

A process and apparatus for sealing a bottom opening in a thermoplastic bottle by:

(a) contacting the bottom of the thermoplastic bottle in the area immediately adjacent the bottom opening with a rotating friction sealing head to raise the temperature of the thermoplastic material to about its melting point, working the hot thermoplastic material into and sealing the bottom opening, and thereafter

(b) quenching the sealed opening.

T913,003
TERNE METAL BATH COMPOSITION

James C. Siple, Franklin Township, Westmoreland County, Pa., assignor to United States Steel Corporation

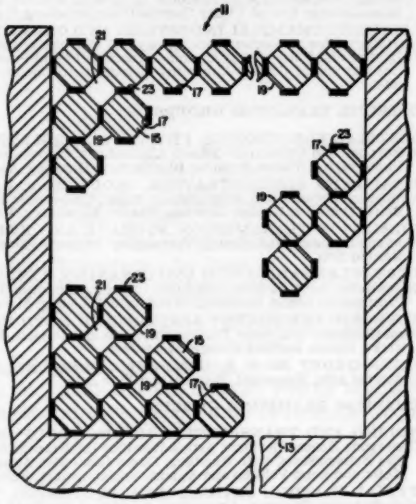
Filed Sept. 25, 1972, Ser. No. 291,848
Int. Cl. C23c *1/06*
U.S. Cl. 117—51
No Drawing. 3 Pages Specification

The subject invention is directed to the use of an economic terne-coating bath composition which provides protective coatings at least equivalent to those of conventional terne-alloy baths. Such conventional baths generally contain about 85 percent lead and about 15 percent tin. Significant economies are achieved in the instant invention by substituting antimony for a major portion of the tin. The new bath composition contains only about 5 to 10 percent tin, .2 to 4% antimony, balance lead.

T913,004
ELECTRICAL WINDING WITH COOLING PASSAGES AND METHOD OF FABRICATING THE SAME

Thomas J. Fagan, Jr., Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 16, 1972, Ser. No. 307,315
Int. Cl. H01f *7/22*
U.S. Cl. 335—216
1 Sheet Drawing. 10 Pages Specification



Individual wires in a winding are formed as polygons having contacting faces and noncontacting faces. Contacting faces of adjacent wires are positively engaged, while the noncontacting faces of adjacent wires form the periphery of openings that extend through the winding. Insulation may be removed from the noncontacting faces to facilitate cooling.

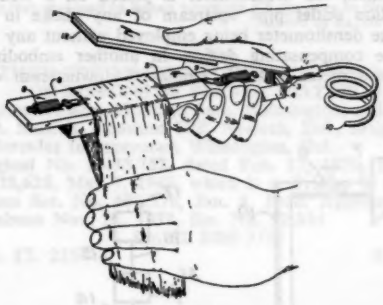
T913,005
METHOD OF TOW SPLICING

Robert E. Duram, Route #10, Galloway Road, Kingsport, Tenn. 37664

Filed Jan. 26, 1973, Ser. No. 327,063
Int. Cl. B65h *69/02*
U.S. Cl. 156—158
3 Sheets Drawing. 4 Pages Specification

Disclosed is a method of splicing the trailing end of a first tow of thermoplastic fibers to the leading end of a

second tow of thermoplastic fibers comprising folding the first and second tows into a "side by side" relationship and heating both tension tows in a region which is substantially perpendicular to the length of the tows so as



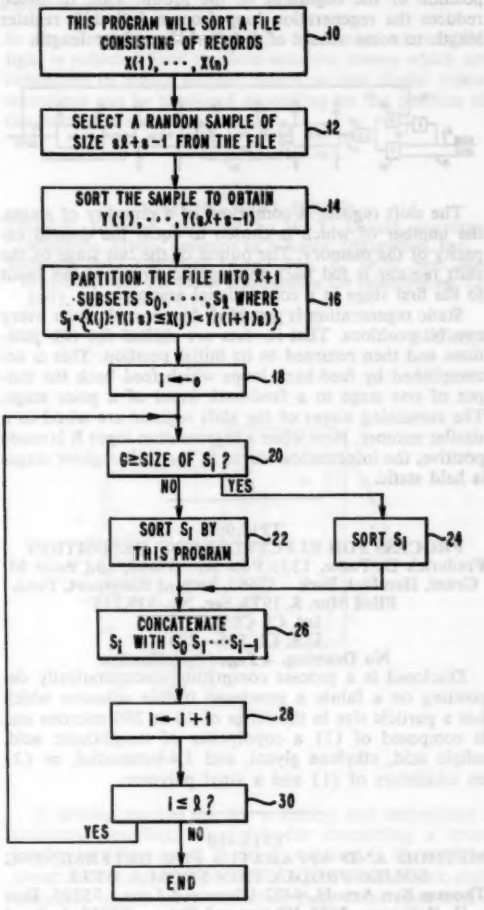
to thermoplastically splice both tension tows together and sever from the remainder of the tows the portion of both tows from the end of the tows to the heated region. Cellulose acetate fiber is a particularly desirable fiber for use in this invention.

T913,006
ANTIOXIDANT DISPERSION AND PROCESS
Michael A. Lynch, LaPlace, La., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Continuation of application Ser. No. 145,905, May 21, 1971. This application Feb. 20, 1973, Ser. No. 333,518
Int. Cl. B01j *1/16*; C08d *7/18*
U.S. Cl. 260—17 R
No Drawing. 8 Pages Specification

The high temperature reaction product of diphenylamine and acetone is an effective antioxidant for rubber and rubbery polymers, but is difficult to disperse directly in water to form suspensions stable against settling. This tendency of the antioxidant to separate out is avoided by providing an aqueous dispersion containing (1) at least 25% by weight of the antioxidant as the dispersed phase, and (2) an aqueous phase having a viscosity of about 3–2000 centipoises and consisting of (a) methyl cellulose having a methoxyl content of 27.5–31.5% and a viscosity, as a 2% by weight aqueous solution, of about 10–1000 centipoises, and (b) up to 3% by weight of an alkali metal alkyl sulfate surfactant, the antioxidant being dispersed as droplets of which over 90% have a particle size of less than about 1.5 microns.

T913,007
SORT PROCESS
Archie Charles McKellar, Mount Kisco, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Continuation of application Ser. No. 214,200, Dec. 30, 1971. This application Feb. 20, 1973, Ser. No. 333,920
Int. Cl. G06f *7/06, 7/22*
U.S. Cl. 444—1
8 Sheets Drawing. 25 Pages Specification

In the sort process disclosed herein, there is first selected a random sample of the records of a file to be sorted into an ordered sequence. This sample may suitably have the size $sl+s-1$ wherein $l+1$ is the quantity of subsets desired from a particular distribution pass and s is a selectable parameter. The selected sample is sorted into an ordered sequence and the file is then partitioned in accordance with every sth key of the sorted sample into $l+1$ subsets. The records of each of the subsets are again partitioned into $l+1$ subsets as described above and this process is continued until the size of the subsets is small enough so that they can be conveniently sorted into respective ordered sequences, preferably employing a tree type sort. The ordered sequences are then concatenated to form the sorted file. The random sample



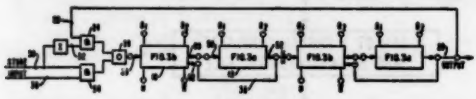
may be provided, for example, by using a random number generator to generate integers in the range of 1 to n wherein n is the total quantity of records in the file until $sl+s-1$ distinct integers have been generated. The records at these integer addresses in the file can then be selected to constitute the sample.

T913,008
DYNAMIC SHIFT REGISTER WITH STATIC REGENERATION
William F. Beausoleil, Poughkeepsie, N.Y. assignor to International Business Machines Corporation, Armonk, N.Y.
Continuation of application Ser. No. 50,618, June 29, 1970. This application Feb. 26, 1973, Ser. No. 335,841
Int. Cl. G11c *11/40*
U.S. Cl. 307—221 C
3 Sheets Drawing. 16 Pages Specification

Data stored in dynamic shift registers must be periodically regenerated to preserve the data. This shift register utilizes a feed-back loop which allows data bits to

be recycled within individual bit stages or groups of bit stages. This allows the register to have the effect of being static without the cost of static shift register cells.

When operating in the static mode, data are regenerated by shifting the output of a single bit position or a group of bit positions back to the input of the same bit position or the beginning of the group. This, in effect, reduces the regeneration loop from a full shift register length to some subset of a full shift register length.



The shift register is comprised of a plurality of stages, the number of which is chosen to equal the desired capacity of the memory. The output of the last stage of the shift register is fed back to a gating circuit at the input to the first stage in a conventional manner.

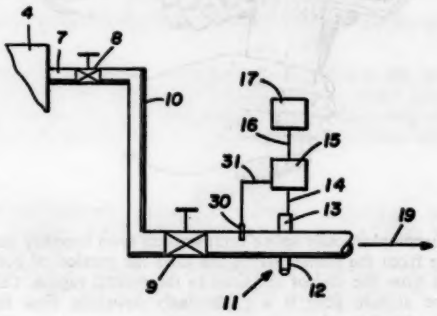
Static regeneration is provided, for example, over every two bit positions. That is, data are shifted for two positions and then returned to its initial position. This is accomplished by feed-back loops which feed back the output of one stage to a feed-back input of a prior stage. The remaining stages of the shift register are wired in a similar manner. Now when a regeneration input R is made positive, the information stored in the shift register stages is held static.

T913,009
PROCESS FOR ELECTROSTATIC DEPOSITION
Frederick D. Petke, 1333 Post St. 37664, and Peter M. Grant, Hemlock Park 37663, both of Kingsport, Tenn.
Filed Mar. 8, 1973, Ser. No. 339,235
Int. Cl. C09j *5/00*
U.S. Cl. 156—283
No Drawing. 4 Pages Specification

Disclosed is a process comprising electrostatically depositing on a fabric a powdered fusible adhesive which has a particle size in the range of 10 to 200 microns and is composed of (1) a copolyester of terephthalic acid, adipic acid, ethylene glycol, and 1,4-butanediol, or (2) an admixture of (1) and a vinyl polymer.

T913,010
METHOD AND APPARATUS FOR DETERMINING SOLIDS PRODUCTION FROM A WELL
Thomas Ben Arnold, 4422 Glenwood Lane 75205, Don R. Patterson, 2822 Whitewood Drive 75233, both of Dallas, Tex.
Filed Mar. 15, 1973, Ser. No. 341,475
Int. Cl. G01n *23/12*
U.S. Cl. 250—308
1 Sheet Drawing. 13 Pages Specification

A method and apparatus for determining, qualitatively and quantitatively, when solid particulate matter, such as sand, is being produced from a well along with the normal well fluid. The method and apparatus utilize at least one densitometer which operates on either a nuclear radiation (e.g., neutrons or gamma rays) attenuation mechanism or a vibrating mechanical element mechanism. The densitometer is used in conjunction with the wellhead and its associated production piping. In one embodiment the densitometer is placed on a wellhead production outlet pipe upstream of any choke in said pipe, the densitometer being employed without any temperature compensating device. In another embodiment the densitometer (11) is employed downstream of a



choke, and temperature compensating means (30, 15) is employed so that the output of the densitometer is adjusted to a constant temperature value. The densitometer can be set to energize an alarm (17), immediately or after a preset time delay, when the detected specific gravity of the well fluid varies beyond a preset minimum and/or maximum. One or more densitometers can be used on a given production outlet pipe. Densitometers can be employed on part or all of the production outlet pipes of a given wellhead.

T913,011
CALCIUM ADDITION TO THORIUM OXIDE
Richard W. Pensak, Pittsburgh, Pa., assignor to the United States of America as represented by the U.S. Atomic Energy Commission
Filed Mar. 16, 1973, Ser. No. 342,130
Int. Cl. C01f *15/00*
U.S. Cl. 252—301.1 R
No Drawing. 2 Pages Specification

This invention relates to a novel process for attaining a well defined and uniform microstructure and a high sintered density for thorium oxide fuel components. These highly desirable features are achieved by the addition of about 50 to 150 parts per million of calcium to thorium oxide powder. Blending is carried out either by mechanically adding calcium to thorium oxide powder or by adding calcium nitrate or other calcium salt in the correctly calculated amount to the thorium oxide production facility. Fuel components prepared from thorium oxide containing this small amount of calcium are particularly suitable in breeder type reactors.

REISSUES

AUGUST 14, 1973

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

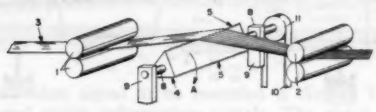
27,727
METHOD FOR MAKING YARN BY FIBRILLATION OF RIBBONS OF PLASTIC MATERIAL

Charles W. Kim, Heritage Park, Wilmington, and Stanley D. Samluk, Chestnut Hill, Newark, Del., assignors to Hercules Incorporated, Wilmington, Del.

Original No. 3,495,752, dated Feb. 17, 1970, Ser. No. 822,625, May 7, 1969, which is a division of application Ser. No. 696,376, Jan. 8, 1968. Application for reissue Nov. 23, 1970, Ser. No. 92,334

Int. Cl. B26f *3/02*

U.S. Cl. 225—3 9 Claims



The present invention relates to a method for making a bulky synthetic fiber with a spun-like appearance by fibrillation of a ribbon of straited film of plastic material that has been oriented predominantly uniaxially in the direction of the striations, the method comprising a serrated edge means that engages the ribbon periodically and includes teeth that contact the ribbon on alternate engagements at points spaced laterally of the ribbon. Preferably, the serrated edge means comprises a threaded rod slabbed to provide a plurality of relatively sharp edges having teeth formed by the original screw thread and which progress spirally of the rod.

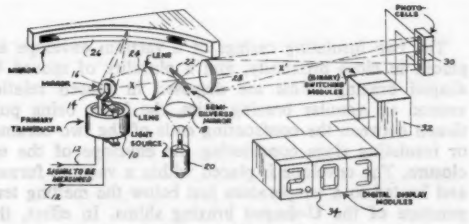
27,728
DIGITAL METER SYSTEM

Gerald Raymond Hosker and Theodore Otto Froelich, London, Ontario, Canada, by American Gage and Machine Company, Chicago, Ill., assignee

Original No. 3,534,348, dated Oct. 13, 1970, Ser. No. 607,017, Jan. 3, 1967. Application for reissue Dec. 1, 1971, Ser. No. 203,919

Int. Cl. G08c *19/36*

U.S. Cl. 340—190 6 Claims



An apparatus for measuring variable conditions of a moveable element including a reflecting means attached to the element for directing light to a coded mirror. The light is reflected back to photo-sensitive means which are connected to digital display means so that digital representations can be produced depending on the position of the moveable element.

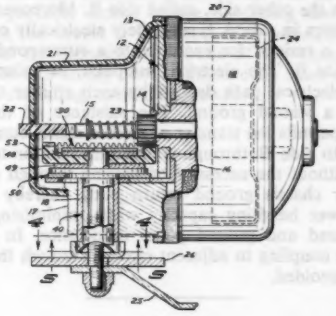
27,729
FISHING REEL DRIVE

Lloyd E. Johnson, deceased, by W. T. Arnold, executor, Mankato, Minn., assignor to Johnson Diversified, Inc.

Original No. 3,487,658, dated Jan. 6, 1970, Ser. No. 704,645, Feb. 12, 1968. Application for reissue Aug. 13, 1971, Ser. No. 171,783

Int. Cl. F16d *7/02*

U.S. Cl. 64—30 C 8 Claims



A driving mechanism for a fishing reel embodying a frictional coupling, or clutch for connecting a crank handle to a line spool. A driven element is disposed between the enlarged inner ends of a pair of concentric shaft members which are provided at their outer ends with a position responsive biasing means for effecting an axially directed tension intermediate the two shaft members to thereby produce a frictional coupling with the driven gear member. Limited relative rotation of the shaft members, one with respect to the other, cooperates with an axially directed camming surface on the outer end of one of the shaft members and a biasing means disposed intermediate the outer ends of the shaft members so that at one relative radial position of the shaft members, the axial tension intermediate the shaft members is of one value and, upon relative rotation of the shaft members to a second radial position, the axial tension intermediate the shaft members is increased or decreased to a different value. This provides, for example, an increased tension when power is applied to the shaft members for reeling in the line onto a fishing reel and a decrease in the tension to allow controlled removal, or unreeling of the line from the reel. The biasing means may be made adjustably variable in nature to provide for a range of operation at the discretion of an operator.

27,730

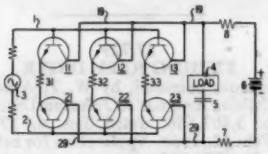
DIFFERENCE AMPLIFIER WITH PARALLEL ISOLATED EMITTER CONFIGURATION

Robert Victor Goordman, Hackettstown, and Ronald Charles Petersen, Bedminster, N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Original No. 3,559,087, dated Jan. 26, 1971, Ser. No. 851,378, Aug. 19, 1969. Application for reissue Apr. 26, 1971, Ser. No. 137,283

Int. Cl. H03f 3/68

U.S. Cl. 330—15 10 Claims



A transistor difference amplifier is disclosed in which one side thereof, called side A, contains a plurality of n transistor elements equal in number to the transistor elements in the other side, called side B. Moreover, each of the emitters in side A is separately electrically connected, through a resistor for example, to a corresponding emitter in side B. The electrical midpoint, or balance point, of the electrical path defined by each emitter to emitter acts as a virtual ground. The existence of the virtual ground permits the transfer of emitter signal current from side A to side B through n separate emitter to emitter paths without the necessity of passing through an actual earth or chassis ground return path, thereby enabling high power handling capacity while minimizing emitter circuit lead and ground plane inductance. In addition, parasitic coupling to adjacent circuits through the ground plane is avoided.

27,731

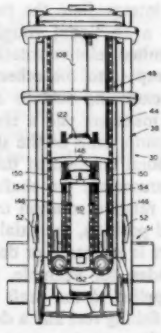
TRIPLE STAGE UPRIGHT FOR LIFT TRUCK

Richard F. McIntosh, Battle Creek, Mich., assignor to Clark Equipment Company

Original No. 3,298,463, dated Jan. 17, 1967, Ser. No. 368,064, May 18, 1964. Application for reissue Feb. 16, 1971, Ser. No. 115,895

Int. Cl. B66b 9/20

U.S. Cl. 187—9 6 Claims



This invention relates generally to a triple-stage telescopic extensible upright or mast assembly supported from the truck and supporting a lift fork or other load engaging means employed with such trucks. More specifically, the invention comprises an improvement in triple-stage upright constructions of the type disclosed in Patent No. 3,213,967.

27,732

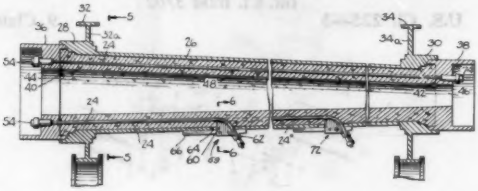
REINFORCEMENT OF CONCRETE STRUCTURES

Myers Van Buren, Cheriton, Va., assignor to Bayshore Concrete Product Corp., Cape Charles Va.

Original No. 3,501,881, dated Mar. 24, 1970, Ser. No. 639,371, May 8, 1967. Application for reissue Feb. 22, 1971, Ser. No. 117,827

Int. Cl. E04c 3/10, 3/34; F16l 9/04

U.S. Cl. 52—223 3 Claims



Use of pretension elongated reinforcing rods in concrete structures, the rods being terminated at various intermediate ends of the structure, and special anchor arrangements for permitting intermediate termination of the rods.

27,733

METHOD OF SEALING AND EVACUATING VACUUM ENVELOPES

Albert Bereza, Elmira, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Original No. 3,656,225, dated Apr. 18, 1972, Ser. No. 862,401, Sept. 30, 1969. Application for reissue Oct. 13, 1972, Ser. No. 297,527

Int. Cl. B23k 31/02

U.S. Cl. 29—472.7 8 Claims

The two insulating casings of a vacuum envelope are placed in close proximity, and a plurality of spaced U-shaped brazing shims are disposed in spaced relation around an annular brazing shim, the latter being positioned between the confronting ends of the two ceramic, or insulating rings constituting the envelope of the enclosure. The envelope is placed within a vacuum furnace and heated to a temperature just below the melting temperature of the U-shaped brazing shims. In effect, this creates a peripheral opening permitting thereby a communicating passage between the interior and the exterior of the envelope for outgassing procedures.

When the desired degree of outgassing and evacuation has occurred, the temperature of the vacuum furnace is raised to the melting point of the plurality of spaced braz-

ing shims, and they melt flowing into the space between the two ceramic or insulating casings, and sealing the same together. No tubulation is needed with this method.

27,734

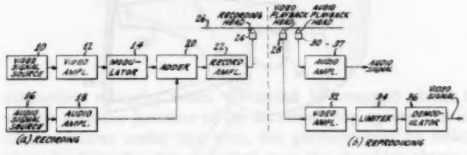
WIDE BAND RECORDING AND REPRODUCING SYSTEM

Henry Ray Warren, Indianapolis, Ind., assignor to RCA Corporation

Original No. 3,482,038, dated Dec. 2, 1969, Ser. No. 515,931, Dec. 23, 1965. Application for reissue Nov. 24, 1971, Ser. No. 202,044

Int. Cl. G11b *5/04;* H04n *5/78*

U.S. Cl. 178—6.6 A 12 Claims



A television signal to be recorded is divided into its video and audio information signals. The video signal is used to frequency modulate a carrier wave. The resultant frequency modulated carrier wave is then added to the audio signal and applied to a recording head for recording on a single track of a magnetic tape.

27,735

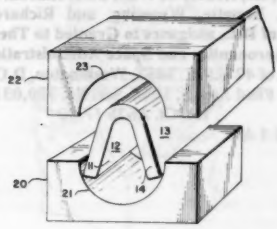
METHOD FOR ATTACHING SUTURE NEEDLE

William H. Shave, Roosevelt, Long Island, and Leonard D. Kurtz, Woodmere, N.Y., assignors to Deknatel, Incorporated, Queens Village, N.Y.

Original No. 3,611,551, dated Oct. 12, 1971, Ser. No. 852,785, Aug. 25, 1969. Application for reissue Aug. 29, 1972, Ser. No. 284,543

Int. Cl. B21d *39/00;* B23p *11/00*

U.S. Cl. 29—515 6 Claims



A method of attaching a suture to a suture needle of the type initially having a V-shaped cross-section channel while substantially eliminating annealing. The channel is forcefully partially closed before hardening the needle, after which the needle is hardened, after which suture is placed into the channel. The walls of the channel are then further and finally closed against each other normally without annealing, to hold the suture.

PATENTS

GRANTED AUGUST 14, 1973

GENERAL AND MECHANICAL

3,751,727
SPACE SUIT

Leonard F. Shepard; George P. Durney; Melvin C. Case; A. J. Kenneway, III; Robert C. Wise; Dixie Rinehart, all of Dover; Ronald J. Bessette, Wyoming, and Richard C. Pulling, Dover, all of Del., assignors to Granted to The United States National Aeronautics and Space Administration Under The Provisions of 42 U.S.C. 2457, Washington, D.C.

Filed Aug. 5, 1968, Ser. No. 750,031
Int. Cl. A62b *17/00*
U.S. Cl. 2—2.1 A **11 Claims**

Disclosed is a pressure suit for high altitude flights and particularly space missions. The suit is designed for astronauts in the Apollo Space Program and may be worn both inside and outside a space vehicle, as well as on the lunar surface. It comprises an integrated assembly of inner comfort liner, intermediate pressure garment, and outer thermal protective garment with removable helmet and gloves. The pressure garment comprises an inner convoluted sealing bladder and outer fabric restraint to which are attached a plurality of cable restraint assemblies. It provides versitility in combination with improved sealing and increased mobility for internal pressures suitable for life support in the near vacuum of outer space.

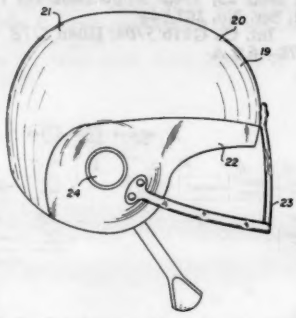
3,751,728
FOOTBALL HELMET

Johnnie Thompkins, Rialto, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Feb. 7, 1972, Ser. No. 224,060
Int. Cl. A42b *3/00*
U.S. Cl. 2—3 R **2 Claims**

An improved football helmet in which the lower section of the helmet is fabricated of transparent plastic so as to eliminate blind areas of vision caused by use of pressure helmets.

A safety hazard in the use of football helmets occurs from restriction of sidewise and upwards vision. Football players

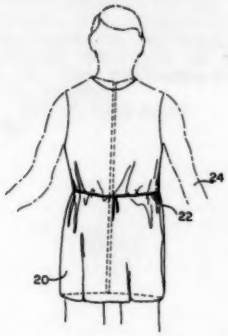


wearing conventional helmets have been injuried because they did not avoid objects which were obscured by the sides or rim of the helmets they were wearing.

3,751,729
REINFORCED EXAMINATION GOWN

Michael E. Trombly, Livonia, and Samuel H. Cowen, Southfield, both of Mich., assignors to Chemed Corporation, Cincinnati, Ohio

Filed Nov. 16, 1971, Ser. No. 199,149
Int. Cl. A41d *9/00*
U.S. Cl. 2—114 **4 Claims**



The invention disclosed is for a method and apparatus for preparing new improved reinforced examination gowns which are disposable after use.

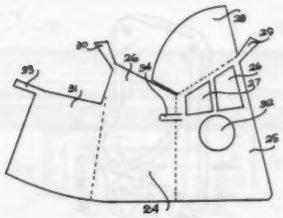
3,751,730
TOGA-LIKE DISPOSABLE GARMENTS

Sophie Zamist, 3010 Grand Concourse, New York, N.Y.

Filed Mar. 24, 1971, Ser. No. 127,713
Int. Cl. A41b *9/00*
U.S. Cl. 2—114 **8 Claims**

A toga-like disposable article of apparel suitable as a medical examination gown or for other purposes. The gown is constituted by a two-dimensional contoured blank formed of sheet material having fabric properties, the contours being

such as to define a front section having access openings therein, and a flap extension adapted to fold over the front section normally to cover the openings. The front is integral with a back section, the front and back sections being provided at their opposing upper corners with complementary tab



extensions whereby when the blank is wrapped about the wearer with the junction of the sections lying against one side of the wearer under one arm, the garment may be held in place by tying the tabs together over the shoulder above the other arm.

3,751,731

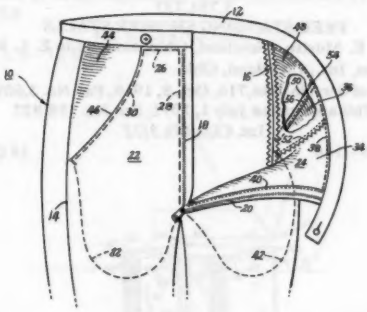
GARMENT CONSTRUCTION

Robert B. Bennett, Englewood, N.J., assignor to Chromalloy American Corporation, New York, N.Y.

Filed July 12, 1972, Ser. No. 270,943

Int. Cl. A41d *1/06, 27/20*

U.S. Cl. 2—227 **7 Claims**



A garment such as trousers, slacks and shorts including a pair of pockets so constructed and arranged as to provide an abdominal supporting band. One side edge of each pocket is secured to the garment fabric near a conventional fly closure and the other side edge of each pocket is secured to the garment cloth near the side seam of the pocket. The widths of the pockets are made slightly less than the confronting portions of the garment cloth so that the pockets form an abdominal supporting band and the garment cloth is allowed to hang freely from the waist band of the garment.

3,751,732

TROUSER-SUSPENDER CONNECTING TROLLEY MEANS FOR TOILET CONVENIENCE

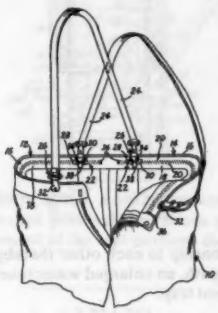
John L. Mott, 1114 N.W. Highlands, P. O. Box 1106, Grants Pass, Oreg.

Filed June 19, 1972, Ser. No. 264,344

Int. Cl. A41d *1/06, 13/02*

U.S. Cl. 2—230 **5 Claims**

For toilet purposes a novel trouser and suspender connecting trolley arrangement is provided consisting of zipper trolleys that extend along the waistline of the trousers from rear to front, and trolley followers carried by the suspender straps for operation around the hips of the wearer. Each follower includes two opposed, zipper operating slides disposed at a fixed short distance from one another, so arranged that in either



direction of operation the leading slide opens the zipper and the following slide immediately closes the zipper, there being no opportunity for clothing to get caught in the open zipper and to interfere with the intended, smooth operation of the follower along the zipper trolley in closing direction.

3,751,733

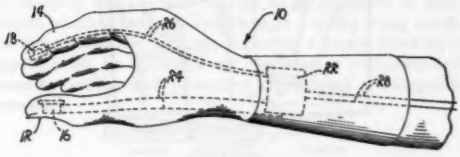
TACTILE SENSING MEANS FOR PROSTHETIC LIMBS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Walter L. Scott, Anaheim, Calif.

Filed Feb. 22, 1972, Ser. No. 228,150

Int. Cl. A61f *1/00, 1/06, 1/08*

U.S. Cl. 3—1.1 **1 Claim**



An improved prosthetic device characterized by a frame including a socket for mounting the frame on the stump of a truncated human appendage and having a plurality of flexible digits extended from the distal end thereof. Within the digits there are transducers, provided as sensing device for detecting tactile stimuli, connected through a power circuit with a slave unit supported by a strap and fixed to the stump, whereby the tactile stimuli detected at the sensing devices are reproduced and applied to the skin of the appendage for thus stimulating sensory organs located therein

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3,751,734

DRAIN TRAP

Robert B. Lumadue, R.D. No. 2, Clearfield, Pa.

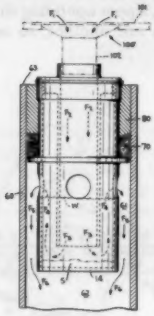
Filed May 21, 1971, Ser. No. 145,637

Int. Cl. E03c *1/28, 1/282, 1/22*

U.S. Cl. 4—197 **7 Claims**

Disclosed is an improved drain trap for use in plumbing installations characterized by ease of installation and resistance

to evaporation of the water contained therein and constructed of a series of concentric, coaxial cylindrical members in



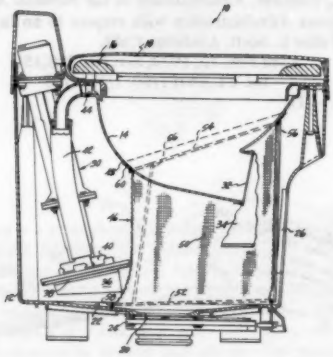
telescoped relationship to each other thereby providing a tortuous flow drain path, an enlarged water reservoir and an easily cleaned sediment trap.

3,751,735

RECIRCULATING TOILET WITH FILTER SCREEN ASSEMBLY

Charles L. Sargent, Ypsilanti; Marshall W. Miller, Ann Arbor, and Gary R. Adiska, Milan, all of Mich., assignors to Thetford Corporation, Ann Arbor, Mich.

Filed Dec. 17, 1971, Ser. No. 209,308
Int. Cl. E03d *5/01, 5/016*
U.S. Cl. 4—10 **8 Claims**



Apparatus in a self-contained toilet system that protects the recirculating pump from becoming clogged, improves cleaning of the liquids in the system and facilitates improved evacuation of the waste materials from the holding tank of the system. The apparatus includes a filter cone of wire mesh that is positioned in the holding tank between the tank and the toilet bowl for confining solid matter in a selected location of the tank spaced from the inlet of the circulating pump but in direct communication with the evacuation opening of the tank.

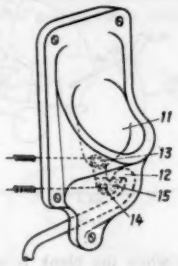
3,751,736

AUTOMATICALLY FLUSHING SANITARY APPLIANCE

Richard Egli, Eichenweg 4, Kusnacht, Switzerland

Filed Nov. 4, 1971, Ser. No. 195,645
Claims priority, application Switzerland, Nov. 12, 1970, 16766/70
Int. Cl. E03d *5/10, 13/00*
U.S. Cl. 4—100 **14 Claims**

Electrodes are located in the appliance which has normally a water level, in a bowl. Water supply is controlled by an electromagnetically operating valve. Upon sensing of change of resistance between a pair of electrodes, for example upon bridging of the electrodes by urine, a time delay period is initiated and a relay pulls in, charging a capacitor. When the resistance between the electrodes reverts back to its normal value, discharge of the condenser is initiated through a multivibrator circuit which triggers opening of the electromagnetic valve for a predetermined period of time, to flush the bowl. In case the drain from the bowl should be obstructed, the electrodes will not revert back to their normal resistance, so that repeated flushing is inhibited.

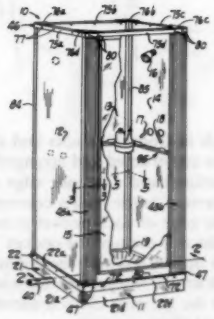


3,751,737

FREE-STANDING SHOWER STALLS

Bernard E. Mustee, Cleveland, Ohio, assignor to E. L. Mustee & Sons, Inc., Cleveland, Ohio

Division of Ser. No. 864,716, Oct. 8, 1969, Pat. No. 3,609,773.
This application July 1, 1971, Ser. No. 158,927
Int. Cl. A47k *3/22*
U.S. Cl. 4—146 **14 Claims**



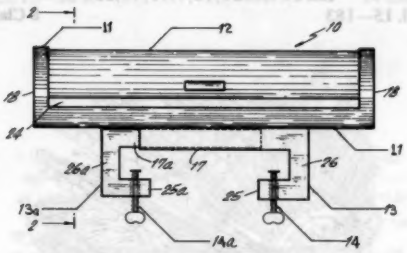
A free-standing shower stall including a base, wall panels joined to the base, a rail connected to the wall panels to impart rigidity to the stall, and a drain connection in the base which permits the shower stall to be placed in any desired location. A shower stall as described wherein the wall panels are plastic and are joined together by imperforate, water tight hinges which permit the panels to be folded for shipment in association with other parts of the stall and to be easily erected during assembly.

3,751,738

DISPENSER FOR TOILET SEAT COVERS

Nicola Vairo, 2855 Lafayette Ave., Bronx, N.Y.

Filed Jan. 25, 1971, Ser. No. 109,330
Int. Cl. A47k *13/16, 13/22*; B23q *3/02*
U.S. Cl. 4—247 1 Claim



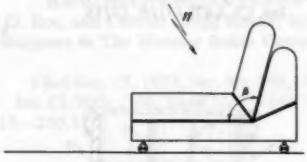
A dispenser for toilet seat covers including a cylindrical roll of discrete sheets arranged in a housing. The sheets are provided with depending tabs so arranged that upon flushing of a toilet bowl, the flushing water automatically removes a used sheet and feeds a new sheet from the housing.

3,751,739

CONVERTIBLE FURNITURE

Allo Assmann, Enger, Germany, assignor to Profilia-Werke Preckel & Waltermann GmbH & Co. KG, Ennigerloh BRD, Germany

Filed Nov. 23, 1971, Ser. No. 201,285
Claims priority, application Germany, Dec. 28, 1970, G 70 47 847.6
Int. Cl. A47c *13/00, 17/14*
U.S. Cl. 5—12 R 7 Claims



A piece of furniture convertible from a couch to a chair is formed of a base having at one end an upwardly sloping portion and a back piece hinged at the upper end of the upwardly sloping portion and movable between a position in which it engages the upwardly sloping portion and is upright to form a backrest and a position in which it extends downwardly and rests on the floor. Two cushion members are provided, the first being hinged at the other end of the base portion and the second to the other side of the first cushion. These can be folded on each other and then onto the base portion to form a chair or seat, with the outer cushion resting against the upright back member.

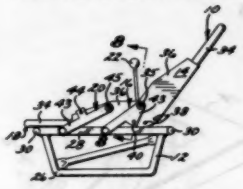
3,751,740

REVERSIBLE RECLINER

Earl H. Belk, 2438 San Francisco Ave., Long Beach, Calif.

Filed Sept. 10, 1971, Ser. No. 179,366
Int. Cl. B60n *1/02*
U.S. Cl. 5—37 6 Claims

A reversible recliner particularly adapted for use in recreational vehicles. The recliner includes a pair of seat portions whose positions are reversible so that when one is a seat back facing in one direction the other becomes the seat bottom. In their reversed positions, the seat back becomes the seat bottom and the first seat bottom becomes a seat back facing in an opposite direction. Both seat portions may be arranged horizontally to form a bed. Locking means enable the seat portions to be locked positively in various pivoted positions, preventing movement of the seat portions during a vehicle accident or the like.

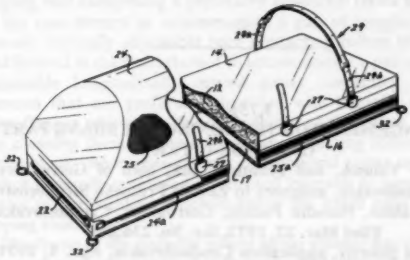


3,751,741

SLEEPING BAG

David V. Hendry, 615 Berkely Ave., Evansville, Ind.

Filed June 11, 1971, Ser. No. 152,340
Int. Cl. A47g *9/00*; A45f *3/22*
U.S. Cl. 5—343 8 Claims



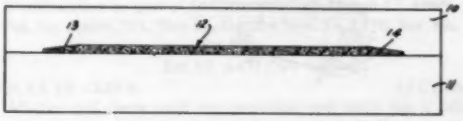
A sleeping bag characterized by an arrangement of components which provide compactness in a transporting condition and ease in use, typically including a kapok filled layer supported by an inflatable air mattress, a self-contained mosquito netting and protective cover, and a collapsible framework.

3,751,742

FILLER FOR USE BETWEEN A BEDSPRING AND A SEPARATE MATTRESS

Richard A. Worley, 458 W. 150th St., Harvey, Ill.

Filed June 21, 1971, Ser. No. 154,937
Int. Cl. A47c *23/04, 27/22*
U.S. Cl. 5—317 R 10 Claims



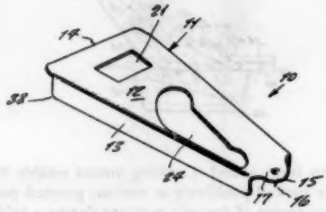
A sheet of polyurethane foam is provided that has beveled edges at least along its longitudinal marginal portions. The beveled sheet is laced on a box spring with its beveled surface directed upwardly and on which a coil-spring or foam-type of mattress is disposed and is thereby supported.

3,751,743

FIVE WAY KITCHEN OPENER

Tom E. Buck, 1318 Stogdill Rd., Bluffton, Ind.

Filed Oct. 19, 1971, Ser. No. 190,570
Int. Cl. B25f 1/00; B67b 7/44
U.S. Cl. 7—14.6 2 Claims



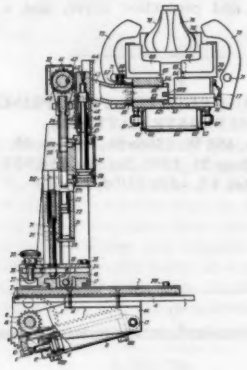
A kitchen tool for opening up various containers such as jars, beverage, and other bottles, and metal cans containing juices or canned milk; the device comprising a one piece member joined of molded tough plastic and having openings for grasping various sizes and shapes of caps in trying to remove them from their containers, and the device having a piercing prong for punching pouring openings in metal cans.

3,751,744

ARRANGEMENT FOR TENSIONING THE SHANK PART OF A SHOE-UPPER

Miloslav Valasek, and Frantisek Zak, both of Gottwaldov, Czechoslovakia, assignors to Zavody Presneko Strojirenstvi Gottwaldov, Narodni Podnik, Gottwaldov, Czechoslovakia

Filed Mar. 22, 1972, Ser. No. 236,869
Claims priority, application Czechoslovakia, Apr. 9, 1971, 2557
Int. Cl. A43d
U.S. Cl. 12—1 A 6 Claims



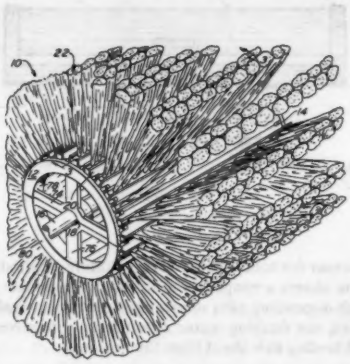
An arrangement for tensioning the shank part of a shoe upper, which shoe upper has been prior tensioned in its toe and heel part, particularly suitable for machines using glueing for connection of individual parts of the manufactured footwear, which arrangement is provided on means transferring the last with the lasted shoe upper to a storage place or to a working site for subsequent treatment of the manufactured footwear, increasing thus the output of the machine.

3,751,745

ROTARY BRUSH APPARATUS

Courtland N. Smith, Jr., Glen Ridge, and Edward L. Verhagen, Rahway, both of N.J., assignors to Sherman Car Wash Equipment Co., Palmyra, N.J.

Filed Apr. 27, 1971, Ser. No. 137,927
Int. Cl. A46b 3/16, 7/10, 13/00
U.S. Cl. 15—183 8 Claims



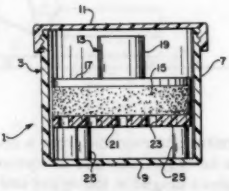
A brush apparatus which comprises a pair of disc members coupled to a shaft. Individual brush elements which comprise anchor strips having axially spaced bristle securing means thereon are provided. Individual bristle tufts are associated with the anchor strips and retained therein.

3,751,746

APPARATUS FOR COLLECTING LIQUID MERCURY

Charles H. Elbreder, 1702 Chase Dr., Fenton, Mo.

Filed Nov. 29, 1971, Ser. No. 202,871
Int. Cl. A47l 13/16, 13/58
U.S. Cl. 15—1 3 Claims

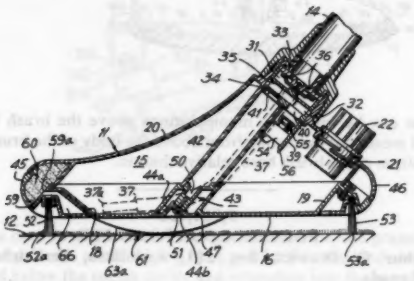


Apparatus for collecting spilled liquid mercury comprising a container and a pad of nonrigid, open-cell foam material for entrapping drops of spilled mercury to permit the transferring of the mercury to the container for release of the mercury therefrom for collection in the container. The pad entraps the spilled mercury when it is compressed against a surface having drops of mercury thereon and holds the mercury within the pad when it is lifted clear of the surface. A perforate plate is mounted in the container spaced above the bottom thereof so as to support the pad when the pad is pressed downwardly thereagainst to effect compression of the pad and release of the mercury entrapped within the pad. A lid is removably secured to the mouth of the container. The container's height is such that a space is provided between the perforate plate and the undersurface of the lid sufficient to permit the pad to rest in a stored position on the perforate plate without compression of the pad.

3,751,747
SURFACE CLEANING APPARATUS

Erik Arne Blaeldh, Skarholmen, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Aug. 25, 1971, Ser. No. 174,786
Int. Cl. A47l *11/03, 11/34, 11/40*
U.S. Cl. 15—50 R 14 Claims

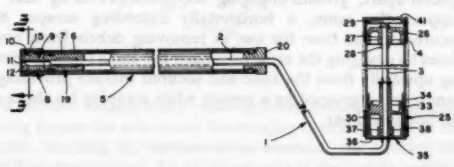


This invention relates to surface cleaning apparatus having a base providing a housing in which foam is generated and from which the foam is discharged on a surface by a distributor in the bottom of the housing. Foam present in the distributor and passageway connected thereto changes into liquid when cleaning is terminated and foam generation is stopped. When normal cleaning ceases the base is supported in an inclined position on the surface so that liquid, which otherwise will drip on the surface from the distributor, is discharged therefrom and directed to flow along the bottom face of the housing which provides a surface to which liquid tends to adhere and along which liquid tends to flow from the distributor toward a place which receives the liquid.

3,751,748
HAND HELD ROLLER FRAME

Elverton O. Roe, and Charles Gregg Moore, both of Wooster, Ohio, assignors to The Wooster Beush Company, Wooster, Ohio

Filed Dec. 15, 1971, Ser. No. 208,132
Int. Cl. B05c *1/08;* B44d *3/28;* F16b *7/14*
U.S. Cl. 15—230.11 6 Claims

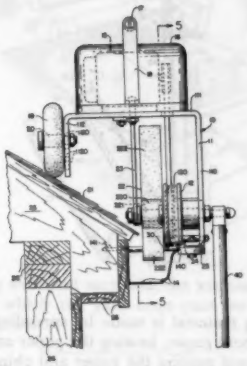


Roller frame includes an expandable core on the roller frame shaft having plural expandable fingers which are forced radially outwardly into frictional engagement with the inner diameter of a roller cover telescoped over the expandable fingers during axial movement of the expandable core in one direction relative to an axially stationary cam hub on the shaft. Removal of the roller cover merely requires the application of thumb pressure to the inboard end of the expandable core which forces the expandable core in the opposite direction releasing the expandable fingers from the locking tension of the cam hub and thereby permitting radial inward movement of the expandable fingers to release the roller cover from the frame. A telescoping handle extension may be attached to the frame handle permitting extension of both the handle and handle extension to any desired length and releasably locked in place for reaching different heights.

3,751,749
POWER GUTTER CLEANERS

Jimmie L. Wilson, 19967 Monte Vista, Detroit, Mich.

Filed Oct. 24, 1972, Ser. No. 300,427
Int. Cl. A46b *13/02*
U.S. Cl. 15—92 5 Claims



A portable power gutter cleaner for cleaning conventional gutters normally installed below and along the lower edge of a sloping roof comprising a preferably aluminum frame formed at the rear thereof to accommodate a pair of longitudinally spaced vertically adjustable roof contacting rollers thereon, and formed at the front thereof to accommodate a pair of non-adjustable longitudinally spaced gutter contacting rollers thereon that are preferably provided with laterally spaced edge flanges which ride the outer flange of the gutter during the cleaning thereof. The said gutter contacting rollers raise momentarily when passing over conventional gutter securing spikes generally employed at selected intervals to secure the gutter to the building structure below the lower edge of the sloping roof.

The frame of the portable power gutter cleaner has an electric motor mounted at the top thereof which drives a rotating cleaner element having a plurality of relatively stiff yet pliable cleaner arms which beat the inside of the gutter as the gutter cleaner is manually moved along a gutter. This beater action knocks loose and drives accumulations of dirt, dried or wet leaves, twigs and other accumulated refuse from the gutter.

The novel power gutter cleaner is manipulated manually along the gutter to be cleaned either from a ladder or from the ground, and is constructed to ride over the transverse gutter-securing spikes generally employed to secure the gutter to the house or other structure below the lower edge of the sloping edge of the roof.

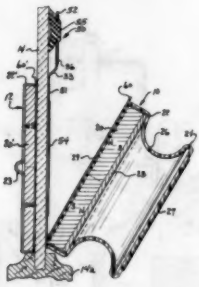
3,751,750
MAGNETIC WINDOW CLEANING APPARATUS WITH IMPROVED CLEANING MATERIAL AND LOCATOR

John A. Kaftan, Marengo, Ill.

Continuation-in-part of Ser. No. 807,524, March 17, 1969, Pat. No. 3,609,793. This application Nov. 19, 1970, Ser. No. 90,900
Int. Cl. A47l *1/08*
U.S. Cl. 15—220 A 14 Claims

Master and slave units are provided and each has a one-piece, plural-polarized permanent magnet. A locator is provided for holding the slave unit in position until the master unit can be brought in position opposite the slave unit. The locator is formed of magnetically-attracted material and has a suction cup for temporary mounting on the window. The cleaning material is formed from a layer of absorbent paper having a discontinuous layer of polyethylene thereon. By being disconsinuous, portions of the paper are exposed so that

it can perform its absorption function. The plastic also reduces the friction between the cleaning material and window, while each magnet has a rubber surface to provide maximum friction between it and the cleaning material. In this manner the cleaning material stays in place without an external fastener.



The cleaning material is made by spreading polyethylene chips on absorbent paper, heating the paper and chips to soften the chips, and passing the paper and chips between two rollers to press the chips into the paper to provide a discontinuous surface of plastic on the paper.

3,751,751

STUDENT'S AND ARTIST'S PAINT BRUSHES

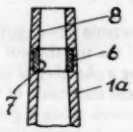
George Karl, 8802 Waizendorf-Bechhofen, Germany

Filed Dec. 8, 1971, Ser. No. 206,100

Claims priority, application Germany, Dec. 21, 1970, P 20 62 815.3

Int. Cl. A46b *3/02*

U.S. Cl. 15—192 1 Claim



To enable the usual ferrule of a student's or artist's painting brush to be made of a plastics material, and to provide for secure anchorage of the usual hair or bristle tuft into said ferrule, the latter accommodates a metal insert which surrounds one end of the tuft and is firmly located in the ferrule, such insert constituting an element to which the tuft can be reliably adhered.

3,751,752

BRUSH WITH ROTATABLE BASE

Kurt Krusche, Frankfurt/Main, and Hubert Zimmermann, Mannheim, both of Germany, assignors to Allstar Verbrauchsguter GmbH, Frankfurt/Main, Germany

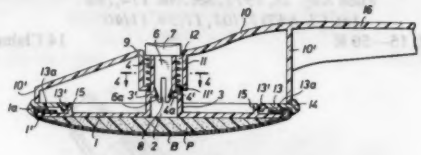
Division of Ser. No. 31,670, April 24, 1970, Pat. No. 3,619,846. This application Aug. 23, 1971, Ser. No. 174,208

Claims priority, application Germany, May 10, 1969, G 69 19 050.7

Int. Cl. A46b *9/10*; A47l *13/46*

U.S. Cl. 15—231 4 Claims

Improved brush with a main body and a selectively rotatable bristle-bearing base on the body. The brush is of the type having at least a predominant part of its bristles inclined in the same direction and is adapted for cleaning purposes. The brush of the invention employs a fabric to carry the bristles, the fabric preferably being backed by a resilient pad. The invention provides improved means for securing the fabric to the base of the brush, improved means for rotatably mounting the base of the brush on the brush body whereby the brush



base can be turned by manipulations above the brush body, and means for indicating from above the body of the brush the position of the brush base relative thereto.

3,751,753

PORTABLE BOOT SCRAPER

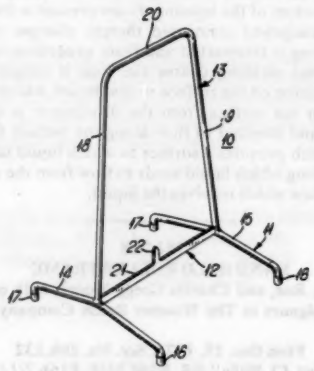
Arthur O. Drewitz, Box 111, Assiniboia, Saskatchewan, Canada

Filed Dec. 13, 1971, Ser. No. 207,484

Claims priority, application Canada, Dec. 17, 1970, 100,922

Int. Cl. A47l *23/22*

U.S. Cl. 15—237 1 Claim



A portable boot scraper having a base structure with spaced-apart, ground-engaging members providing feet to support the same, a horizontally extending scraper bar secured to the base for use in removing debris from one's shoes by dragging the same over such bar and a frame projecting upwardly from the base and secured thereto providing a handle to be grasped by a person while scraping his shoes on the horizontal bar.

3,751,754

WINDSHIELD WIPER ASSEMBLY

William J. Quinlan, and Lawrence L. Huver, both of Hastings, Mich., assignors to Hastings Manufacturing Company, Hastings, Mich.

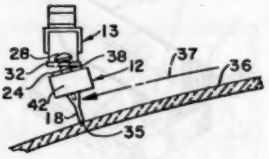
Continuation-in-part of Ser. No. 190,067, Oct. 18, 1971, which is a continuation-in-part of Ser. No. 90,987, Nov. 19, 1970, Pat. No. 3,717,900. This application June 5, 1972, Ser. No. 259,672

Int. Cl. B60s *1/40*

U.S. Cl. 15—250.42 11 Claims

A wiper blade unit has fasteners extending through clearance apertures in an arm connector so that the blade unit may become laterally canted within limits relative to the arm connector in both wiping directions. The blade unit includes a resilient blade body having a crown portion with a cavity containing metallic leaf springs and a wiping portion beneath the

crown portion including a narrow wiping lip and an intermediate body portion which is progressively narrower in cross section from the base of the crown portion in the direction of the wiping lip. A longitudinally extending hollow core which is capable of cross sectional deformation to correspondingly deform and vary the resiliency of the body portions surrounding the core as a function of changes in direction and pressure of wiping forces at the wiping lip is provided in the blade body spaced below the spring cavity and extending into the progressively narrower intermediate portion. Straps inserted into end portions of the cavity are provided with closure caps which abuttingly engage the leaf springs and prevent longitudinal movement of the springs relative to the blade body.

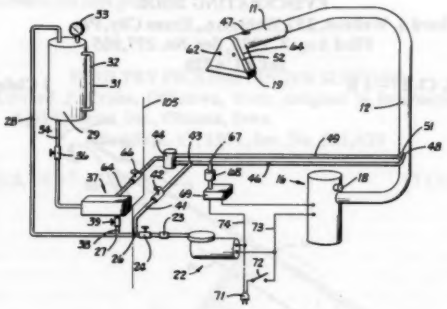


3,751,755

VACUUM CLEANER HAVING A FOAM GENERATOR

Judson L. Smith, 3714 S. Juniper St., Tempe, Ariz.

Filed Mar. 12, 1971, Ser. No. 123,566
Int. Cl. A47k 5/14; A47l 5/36
U.S. Cl. 15—302 **8 Claims**



A vacuum cleaner has a cleaning foam generating and conveying means for selectively discharging cleaning foam at the nozzle, brushing the surface to be cleaned, and sucking the dirt from the surface. An air bleed port at the nozzle controls application of foam or suction at the nozzle. Compressed air pressurizes and propels cleaning liquid from a reservoir to an air charged foam generator to generate the foam. An electric switch or a manual valve at the nozzle are included as alternate embodiments of the foam control.

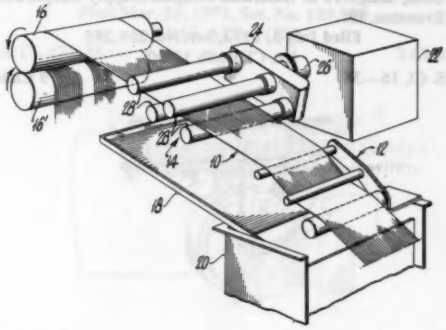
3,751,756

VACUUM STRIPPER

Joseph W. Arnett, Jr., Severna Park, Md., assignor to Concorde Fibers, Inc., Columbia, Md.

Filed Feb. 3, 1972, Ser. No. 223,129
Int. Cl. A47l 5/38
U.S. Cl. 15—306 A **9 Claims**

A vacuum stripper for removing excessive moisture from quenched extruded thermoplastic yarn ends which comprises a vacuum source, a manifold communicating with said vacuum source, and a plurality of vacuum tubes disposed above and below the path of movement of said yarn ends, communicating with said manifold, the vacuum tubes having openings over which the yarn ends pass for removing the moisture therefrom.

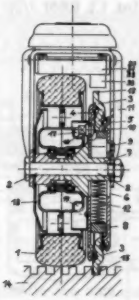


3,751,757

SWIVEL CASTORS, PARTICULARLY FOR SHOPPING TROLLEYS

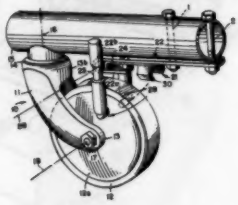
Herbert Stosberg; Horst Fleischmann, both of Wermelskirchen-Tente, Rhineland; Gunter Reinhards, Wermelskirchen/Rhineland, and Siegfried Engels, Wermelskirchen-Tente, Rhineland, all of Germany, assignors to Tente-Rollen Gesellschaft Mit Beschrankter Haftung Companie, Wermelskirchen-Tente ap Rhineland, Germany

Filed June 3, 1971, Ser. No. 149,600
Claims priority, application Germany, Feb. 6, 1971, P 21 05 547.0
Int. Cl. B60b 33/00
U.S. Cl. 16—35 **17 Claims**



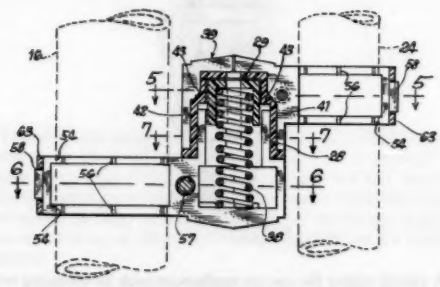
A swivel castor for use on appliances such as shopping trolleys, which are conveyed on a ribbed or grooved conveyors comprises a castor fork with a running wheel and a tracking wheel arranged for rotation with and on the same axle as the running wheel. The tracking wheel is movable vertically in respect of the running wheel so that when the appliance is placed on the conveyor the tracking wheel can drop into a groove thereof. While the castor is running on a flat floor the tracking wheel hold a locking mechanism in inoperative position. When the tracking wheel drops into a groove the locking mechanism locks the wheel against running movement. The locking mechanism also includes a vertically movable member which follows the downward movement of the tracking wheel to lock the castor against swivelling movement. The latter member may be a pawl which engages ratchet teeth on the backset bearing or in an incision or groove in the castor fork. The vertical movement of the member can be controlled by the periphery of the tracking wheel or by an upper extension of the bearing disc of the tracking wheel.

3,751,758
CASTER AND SWIVEL LOCK ASSEMBLY
Roland K. Higbee, and David C. Fleck, both of Cincinnati, Ohio, assignors to American Hospital Supply Corporation, Evanston, Ill.
Filed July 5, 1972, Ser. No. 269,285
Int. Cl. B60b 3/00
U.S. Cl. 16—35 9 Claims



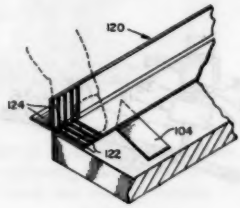
A self-aligning swivel caster for use on carts and the like, the caster being equipped with a releasable locking member capable of selectively locking the caster against swivel movement. The locking member is gravity actuated and may be latched in an operative position as desired. The structural relationship of the caster and locking member are such that automatic camming and subsequent actuation of the locking member occur as the caster wheel is swiveled from an unlocked position into a position in which it is capable of being locked; during actuation of the locking member, direct contact is made between such member and the wheel until finally the member drops into its locking position to prevent further swivel action of the wheel.

3,751,759
GATE HINGE AND CLOSER ASSEMBLY
Alan W. Duncan, River Forest, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill.
Filed Mar. 8, 1972, Ser. No. 232,696
Int. Cl. E05f 3/20
U.S. Cl. 16—50 8 Claims



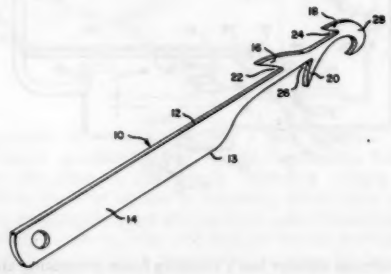
A gate hinge and closer assembly arranged to close a fence gate includes a bearing component and a hanger component. Either component is attached to a fence post and the other attached to the fence gate. One of the components has a hollow open-ended pintle, a bearing member mounted in the pintle and biasing means while the other component has a pintle socket and a camming surface fixedly disposed in the pintle socket. When the gate is opened, the biasing means is compressed by the bearing member being cammed along the camming surface, thereby providing the necessary force for the return movement of the bearing member along the camming surface and the movement of the gate toward its closed position. The assembly is constructed for relative movement between the bearing member and the camming surface irrespective of whether the pintle or the camming surface is held stationary, and irrespective of the direction of the opening of the gate.

3,751,760
PLIABLE TAPE STRUCTURE
Alfred W. Wakeman, Madison Rd., Durham, Conn.
Continuation-in-part of Ser. No. 859,619, Sept. 22, 1969. This application July 6, 1971, Ser. No. 159,796
Int. Cl. E05d 7/00
U.S. Cl. 16—150 24 Claims



A flexible longitudinally continuous tape construction is disclosed for use in joining mating edges of juxtaposed members, the tape having an X-like configuration transversely of its length to provide legs adapted to receive and be secured to the edges of the members to be joined. The tape is capable of serving as a pliable hinge to permit articulation of the joined members, or it may also serve simply as a binding for joining members intended to be fixed relative to each other. The tape construction combines longitudinally continuous marginal web portions or carriers, forming the extremities of the legs of the X, with longitudinally spaced strand or equivalent connector means running crosswise of and interconnecting pairs of marginal web portions. The connector means intersect and interlock forming the axis of the X-like configuration.

3,751,761
EVISCERATING TOOL
Richard J. Weiland, 217 Wahl Ave., Evans City, Pa.
Filed Aug. 3, 1972, Ser. No. 277,905
Int. Cl. A22b
U.S. Cl. 17—1 R 1 Claim

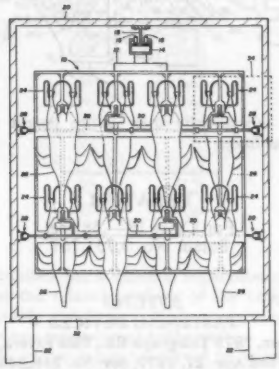


An eviscerating tool for removing the entrails of animals having an elongated body member with blunt edges and a handle portion at one end. At the other end, the tool has a plurality of lobes with blunt edges extending from both longitudinal blunt edges of the body member and forms acute angles with the body member in the direction opposite the handle. The body member has a curved tip portion at the end opposite the handle portion.

3,751,762
MULTIPLE FOWL CARRYING APPARATUS
Janus J. Dillon, Irving, Tex., assignor to Food Equipment Inc., Dallas, Tex.
Filed Sept. 20, 1971, Ser. No. 181,840
Int. Cl. A22c 21/00
U.S. Cl. 17—11 R 9 Claims

A multiple fowl carrying apparatus useful in automated fowl processing includes a shackle mounting frame. The mounting

frame is connected to a conveyor system that routes it through certain unit operations, which can include washing, chilling and preparation for packaging. The shackle mounting frame carries a plurality of pivotally mounted shackles, movable between a first and a second position. In the first position the shackles can suspend a fowl by its legs in a processing position. When the shackles are pivoted to the second position, the fowl



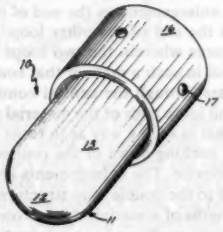
will drop from the shackles, readying them for further processing, packaging or the like. The apparatus includes mechanism for holding the shackles in the first position and for releasing the shackles so they can pivot to the second position. The shackles are counterweighted about the pivotal mounting so that in the absence of a fowl they are biased toward the first position.

3,751,763

POULTRY PICKING FINGER SUPPORT

Edward J. Crane, Ottumwa, Iowa, assignor to International Agri-Systems, Inc., Ottuma, Iowa

Filed Sept. 17, 1971, Ser. No. 181,439
Int. Cl. A22c *21/02*
U.S. Cl. 17—11.1 R **17 Claims**



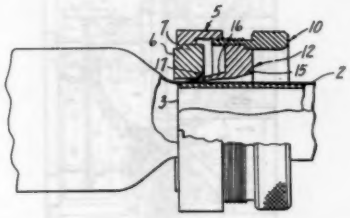
A picking finger support suitable for utilization in mechanical poultry picking machines including a bullet-shaped section formed from generally resilient material such as hard rubber. The bullet-shaped section is provided with a plurality of apertures at suitable locations thereover for receiving and retaining generally conventional picking fingers. The rear portion of the picking support is provided with a threaded interior so as to threadably receive the threaded hub on a picking apparatus. Positioned over the exterior of the threaded portion of the support is a reinforcing ring containing suitable apertures for a span wrench.

3,751,764

CASING SIZER

Arnold E. Dobbert, Fremont, Calif., assignor to Rheem Manufacturing Company, New York, N.Y.

Filed Mar. 31, 1971, Ser. No. 129,922
Int. Cl. A22c *11/02*
U.S. Cl. 17—35 **2 Claims**



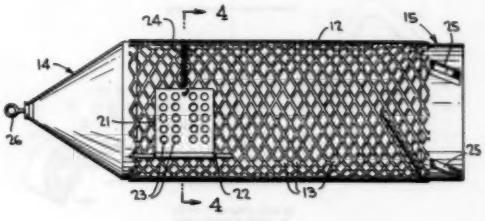
A casing sizer including an annular resilient ring provided with a radially deformable portion and adjustment means for compressing said portion radially inwardly to increase the frictional drag on the casing and therefore the size of the stuffed sausage. A swingable mount is provided for disconnecting the sizer from the stuffing horn when desired.

3,751,765

FISH SCALER DEVICE

Billy Joe Reeves, Campbellton Hwy., and James L. Chancey, 1111 Martin St., both of Dothan, Ala.

Filed June 21, 1971, Ser. No. 154,915
Int. Cl. A22c *25/02*
U.S. Cl. 17—64 **4 Claims**



A floatable fish scaler device and method of automatically removing scales from fish by means of water pressure as the device is towed through the water, including a cylindrical and rotatable water-permeable fish basket, a floatable nose cone at the forward end of the basket and a floatable rear cone at the rearward end of the basket having outer impeller blades thereon for imparting rotation to the device as it is towed through the water.

3,751,766

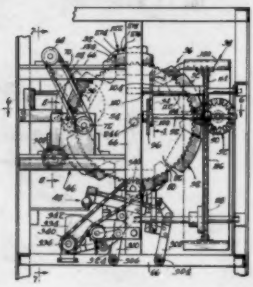
SHRIMP PROCESSING MACHINE AND METHOD

Gregor Jonsson, 1520 Berkeley Road, Lake Forest, Ill.

Division of Ser. No. 783,807, Dec. 16, 1968, Pat. No. 3,566,437. This application Feb. 18, 1971, Ser. No. 116,570
Int. Cl. A22c *29/00*
U.S. Cl. 17—71 **11 Claims**

A shrimp processing machine and method including an intermittently operating conveyor from which beheaded shrimp are pulled tail first by sets of clamps on a rotary wheel turning at a uniform rate. The shrimp shells and part of the meat are

slit, and the sand vein is removed by the rotary brush. The intermittently operating conveyor mechanism is driven from the



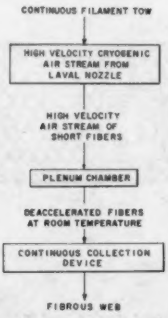
rotary wheel by a Geneva drive mechanism. The shrimp meat is finally removed from the shell by a shell separating mechanism and delivered to a discharge conveyor.

3,751,767

PROCESS FOR THE FORMATION OF FIBROUS WEBS OF STAPLE FIBER FROM CONTINUOUS TEXTILE FILAMENTS

Preston F. Marshall, Walpole, Mass., assignor to The Kendall Company, Walpole, Mass.

Filed Jan. 28, 1971, Ser. No. 110,446
Int. Cl. D01g *1/00*
U.S. Cl. 19—.58 **1 Claim**


CONTINUOUS FILAMENT TOW
HIGH VELOCITY CRYOGENIC AIR STREAM FROM LAVAL NOZZLE
HIGH VELOCITY AIR STREAM OF SHORT FIBERS
PLENUM CHAMBER
DEACCELERATED FIBERS AT ROOM TEMPERATURE
CONTINUOUS COLLECTION DEVICE
FIBROUS WEB

Continuous textile filamentary material is converted into a web of short fibers of graduated length by shattering the filaments in an air jet stream of a velocity which is at least 1.5 times sonic velocity, at a calculated temperature of not over −100°F.; diffusing the resultant short fibers into a plenum chamber; and collecting the fibers in web form on a conveyor.

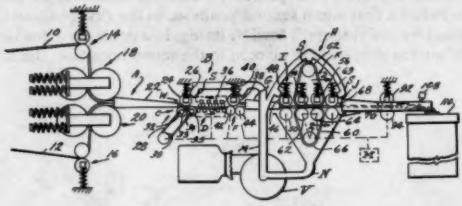
3,751,768

APRON DRAFTER FOR TEXTILE SYSTEM

Elbert F. Morrison, and Raymond D. Joy, both of Clarksville, Va., assignors to Burlington Industries, Inc., Greensboro, N.C.

Division of Ser. No. 842,865, July 18, 1969, Pat. No. 3,609,836. This application Apr. 20, 1971, Ser. No. 135,587
Int. Cl. D01h *5/86*
U.S. Cl. 19—244 **7 Claims**

An apron drafting means for controlling fibers in such a manner that the fibers may be drafted at a higher draft and are capable of being drawn from the apron drafting means with



pressure on substantially their entire length and without breaking of the fibers.

ERRATUM

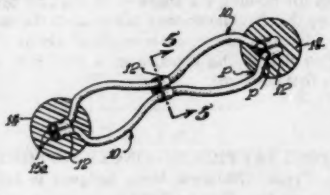
For Class 19—.58 see:
Patent No. 3,751,767

3,751,769

FASTENING DEVICES

Kenneth Reiner, 7875 Telegraph Rd., Pico Rivera, Calif.

Filed Apr. 21, 1972, Ser. No. 246,340
Int. Cl. A44b *21/00;* **A45d** *8/00*
U.S. Cl. 24—73 ES **11 Claims**



An improvement in fastening devices of the type comprising two centrally connected resilient loops and in which each loop has an enlargement (as a bead or other ornament) at its outer end, whereby the device may be stretched around an article, as for example a tress of hair, such as a pony tail and fastened by slipping the enlargement on the end of one loop under the enlargement at the end of the other loop. The improvement provides structures wherein the two loops are formed of the resilient material in such a manner that continuous lengths of the material pass through the central contiguous area of the two loops and all loose ends of the material are held within the end enlargements in such a way as to resist being pulled apart by strain or by necking down of the resilient material in normal use of the device. The enlargements are fixedly attached, one at each end to the double loop structure, in such a manner that the two lengths of material which protrude from each enlargement are each positioned at a substantial angle to the longitudinal axis of the device.

3,751,770

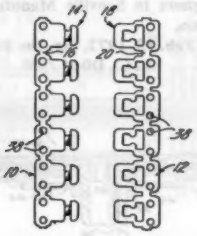
CLOSURES

Larry Italiano, 235 North St., New Hyde Park, N.Y.

Continuation-in-part of Ser. No. 26,980, April 9, 1970, abandoned. This application July 26, 1971, Ser. No. 166,025
Int. Cl. A44b *19/04*
U.S. Cl. 24—204 **5 Claims**

The disclosed closure for garments and the like includes a headed male member and a companion slotted female member, both blanked out of tough, pliant plastic sheets. The male member of sheet plastic is assembled to the female

member that is also of sheet plastic by inserting a male head portion of the blanked outlet into an opening in the female member having an outline that includes a transverse enlargement, then shifting the neck of the male member into a slot in the blanked opening of the female member. That opening has a guiding pair of divergent edges, leading first to a slot construction that is spaced from an end abutment of the slot. The



constriction inhibits the accidental separation of the closure members, but the related portions of the closure members promote assembly and disassembly in a way to overpower the constriction when manipulated deliberately.

Strips of the closures can be curved by bending the sheet material out of its plane and each strip is narrow or has narrow connections so that the strips can be flexed in their own planes.

3,751,771

DEVICE FOR SECURING TEXTILE OR OTHER MATERIAL UNDER TENSION

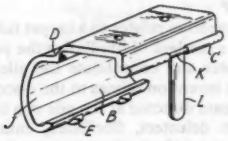
Richard Gabriel Vipond, "Brackens," Bishops Walk, Addington, England

Filed Jan. 23, 1970, Ser. No. 5,222

Claims priority, application Great Britain, Jan. 27, 1969, 4,455/69

Int. Cl. A44b *21/00*

U.S. Cl. 24—248 SL **6 Claims**



A device for securing tensed fabric comprising a longitudinal clip of D-shape cross-section having the curved part hinged to the flat part along one side; the other side of the curved part bears teeth and clips onto the flat part. The clip is opened, the flat part attached to a base, the fabric is impaled onto the teeth and the clip is then snapped shut with the fabric gripped between the two parts, the action of closing the clip also serving to tension the fabric.

3,751,772

TERMINAL GRIPPING DEVICE FOR ELASTIC CORD

Charles Grandjanny, 102, Avenue General Leclerc, 69 Caluire, France

Filed Apr. 23, 1971, Ser. No. 136,912

Claims priority, application France, May 13, 1970, 7017322

Int. Cl. F16g *11/00*

U.S. Cl. 24—126 C **3 Claims**

The invention is a terminal cord gripping device for securing a hook on the end of an elastic cord, the device comprising a gripper capping the end of the elastic cord and a hook formed with a conical hole; the gripper having flexible gripping jaws and being inserted into the conical hole through

its wide opening for self-tightening of the gripper on the cord end as it is driven into the conical hole.

3,751,773

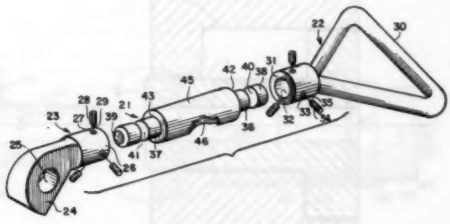
OIL WELL SLIP HANDLE WITH ROTATABLE COMPONENTS

Harold C. Clark, 3486 N. Ventura Ave., Ventura, Calif.

Filed Aug. 21, 1972, Ser. No. 282,408

Int. Cl. A44b *21/00*

U.S. Cl. 24—263 HA **7 Claims**



An oil well slip handle has essentially three mutually rotatable parts constituting a virtually indestructible heavy duty slip handle.

A central holding unit has a rigid core and opposite ends formed with bearing raceways that aid in making swivel connections with a removable hand grip and a removable attachment element structured for securement to a slip body. The attachment element and hand grip are interchangeable.

3,751,774

APPARATUS FOR CORRECTING WEFT DISTORTIONS IN WOVEN WEBS

John H. Hannaway, Pawtucket, R.I., assignor to Mount Hope Machine Company, Incorporated, Taunton, Mass.

Division of Ser. No. 874,503, Nov. 6, 1969, Pat. No. 3,636,598.

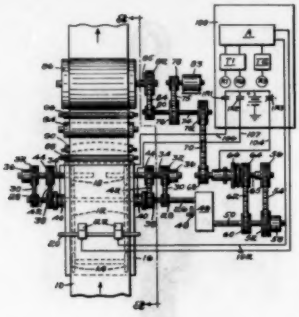
This application Oct. 12, 1971, Ser. No. 187,973

Int. Cl. D06h *3/12*

U.S. Cl. 26—51.4 **11 Claims**

Bow distortions of the weft threads of woven webs are removed by normally operating a tenter frame at a slightly faster speed than a roll feed drawing the web forwardly from the tenter, thereby intentionally inducing a lagging bow in the

web. Bow detection means are connected to momentarily slow the speed of the tenter to less than that of the roll feed when the lagging bow attains an acceptable maximum, allowing the



weft threads to return to a straight configuration and eventually toward a leading bow of maximum acceptable magnitude, whereupon, the tenter is caused to resume its normal slightly faster speed.

3,751,775

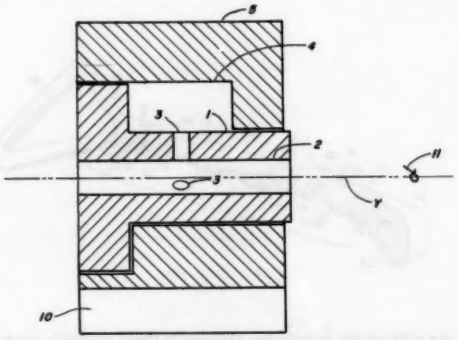
APPARATUS AND PROCESS FOR COMMINGLING MULTIFILAMENT YARN

John Dimocritos Psaras, Richmond, Va., assignor to Allied Chemical Corporation, Morristown, N.J.

Filed June 7, 1972, Ser. No. 260,676

Int. Cl. D02g 1/16

U.S. Cl. 28—1.4 **13 Claims**



An improved apparatus and method for commingling multifilament yarn has been found. The apparatus comprises an elongated body having a straight yarn passageway with at least three orifices substantially equally spaced about the periphery of the body at substantially the same level. The orifice center lines are offset so that at least two do not intersect with the center of the effective diameter of the yarn passageway, yet all pass within an imaginary circle having a diameter about one-third the effective diameter, and the same center as the effective diameter, at the orifice level. Also, at least two of the center lines extended from the orifices should pass outside the imaginary circle at the orifice level section having the same center but only 0.02 of the effective diameter of the yarn passageway. The plane at the orifice level must be located within a length one-half the length of the yarn passageway and centered on the midpoint of the yarn passageway. These orifices communicate with a source of high pressure fluid. The high pressure fluid flows through the orifices into the yarn passageway causing a vortex of swirling fluid so that any yarn passing linearly through the passageway would have filaments commingled with one another. This improved process of entangling multifilament yarn can operate at from about 3,000 to about 8,000 feet per minute by passing continuous multifilament yarn through the above-described vortex.

3,751,776

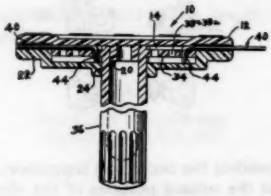
YARN DESIGN FORMING TOOL

James B. Kruger, Oxford, and Joseph Cooper, Westport, both of Conn., assignors to Scoville Manufacturing Company, Waterbury, Conn.

Filed Feb. 15, 1972, Ser. No. 226,609

Int. Cl. D04d 7/06

U.S. Cl. 28—2 **5 Claims**



A yarn design forming tool has upper and lower plates sandwiching for rotation a drive plate having arcuate slots, uniformly formed, radiating about its center. The slots each have a flat portion at its outer end. The slots receive the short legs of L-shaped pins respectively and drive them in or out from the periphery of the plates depending on the direction of rotation of the drive plate. The flat portions lock yarn-holding pins in their outward position during the design forming process. The pins move in precisely radial channels.

3,751,777

PROCESS FOR MAKING TUFTED PILE CARPET

Hilaire Marcel Turmel, 260 Garceau St.; Dorothy Ellen Lackie, Hemmings Falls Rd., both of Drummondville, Quebec, and Sohinder Nath Chopra, 1379 Aberdeen St., Hawkesbury, Ontario, all of Canada

Filed July 9, 1971, Ser. No. 161,334

Int. Cl. D05c 15/00

U.S. Cl. 28—72 P **8 Claims**

The present invention relates to a carpet tufted with a fibrillatable yarn and a method of fibrillating the yarn in the carpet to thereby deluster and consolidate the pile. More particularly, the present invention relates to the discovery that a high velocity fluid stream directed at the pile of a carpet tufted of a fibrillatable yarn delusters, fibrillates, entangles and consolidates the pile thereof.

3,751,778

PROCESS FOR THE SIMULTANEOUS TEXTURING AND DYEING OR FINISHING OF THERMOPLASTIC YARNS

Pierre Grosjean, Sainte-Foy-Les-Lyon; Rene Guillermin, Bron, and Roger Vidal, Champagne, all of France, assignors to Societe Rhodiaceta, Paris, France

Filed Oct. 7, 1971, Ser. No. 187,407

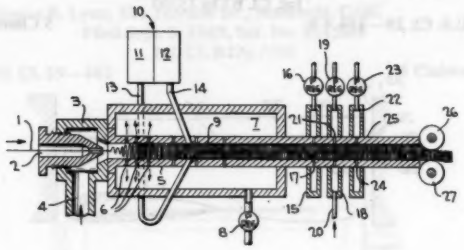
Claims priority, application France, Oct. 14, 1970, 7037348; July 26, 1971, 7127557

Int. Cl. D02g 1/12

U.S. Cl. 28—72.14 **15 Claims**

A process for the simultaneous texturizing, i.e. crimping, and dyeing or finishing of thermoplastic yarns comprising packing and compressing the yarns into a confined space through introduction of a flow of a compressed fluid heated to a temperature sufficient to set the yarns, allowing a portion of the compressed fluid to provide movement of the yarns axially in the confined space with the remainder of the fluid escaping laterally from the confined space into further annular space under a pressure lower than the pressure of the confined

space, but higher than atmospheric pressure; and simultaneously introducing at least one dyeing solution or finishing agent into the confined space over the compressed yarns, such process being characterized in that the compressed yarn is continuously passed through at least one expansion zone and



thereafter through at least one zone in which a further fluid is introduced under pressure. Such process allows for the simultaneous dyeing or finishing of thermoplastic yarns in a high speed texturizing process.

3,751,779

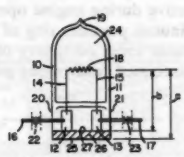
PINCH BASE ELECTRIC LAMP WITH TRANSVERSELY ARRANGED SUPPLY WIRES

Riksterus Auguste Johannes Maria Meijer, Emmasingel, Eindhoven, and Jan Christiaan Pennekamp, Heerlen, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 824,478, May 14, 1969, Pat. No. 3,617,797. This application May 17, 1971, Ser. No. 144,342

Int. Cl. H01j *9/18*

U.S. Cl. 29—25.15 **2 Claims**



A pinch-base lamp and method of making same were foils are sealed in the pinch, and secured to each foil are one end of a pole wire oriented generally parallel to the lamp axis and one end of a supply wire oriented at a right angle to the pole wire. When the lamp is mounted the laterally-extending supply wires are subjected to torsional instead of bending stress, thereby reducing the likelihood of fracturing the pinch, and the base of the pinch, being free of supply wires, may be ground to provide an accurate reference surface from the filament.

3,751,780

ULTRA SHARP DIAMOND EDGES FOR ULTRA THIN SECTIONING AND AS POINT CATHODE

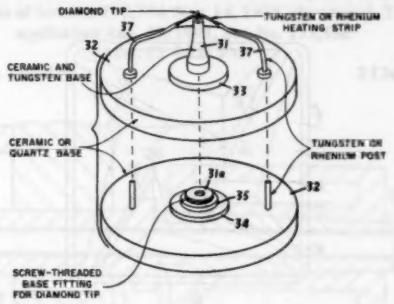
Humberto Fernandez-Moran Villalobos, 5807 Dorchester Ave., Chicago, Ill.

Division of Ser. No. 829,267, June 2, 1969, Pat. No. 3,646,841, Continuation-in-part of Ser. No. 466,877, June 22, 1965, Pat. No. 3,447,366. This application Dec. 22, 1971, Ser. No. 211,138

Int. Cl. B26d *1/00*; B28b *5/04*

U.S. Cl. 29—95 R **3 Claims**

Ultra sharp diamond edge is used for molecular and submolecular sectioning at ultra low temperature and as a high intensity point source for the emission of electrons rons and neutrons.


DIAMOND TIP
TUNGSTEN OR RHENIUM HEATING STRIP
CERAMIC AND TUNGSTEN BASE
CERAMIC OR QUARTZ BASE
TUNGSTEN OR RHENIUM POST
SCREW-THREADED BASE FITTING FOR DIAMOND TIP

3,751,781

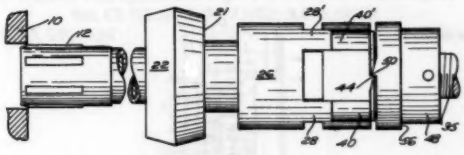
ADJUSTABLE BURNISHING TOOL

Eldo K. Koppelmann, Cumberland, R.I., assignor to Amtel, Inc., Providence, R.I.

Continuation-in-part of Ser. No. 27,628, April 13, 1970. This application Jan. 24, 1972, Ser. No. 220,295

Int. Cl. B21c *37/30*

U.S. Cl. 29—90 R **6 Claims**



An adjustable burnishing tool with a mandrel member having a frusto-conical end portion and a roller cage for engagement therewith which receives a plurality of frusto-conical rollers that operate in a planetary system against the mandrel and which includes means for relatively moving the cage and the work while the mandrel moves the rollers into contact with the work and includes a mechanical means to lock the cage in size relation to the work, while the rollers are in contact therewith, and maintain this size adjustment while the roller burnishing tool is moved into the bore hole or around the cylindrical work piece to be burnished.

3,751,782

THROW AWAY TIPS FOR METAL CUTTING TOOLS

Harvey Fruish, Northampton, England, assignor to Alfred Herbert Limited, Coventry, England

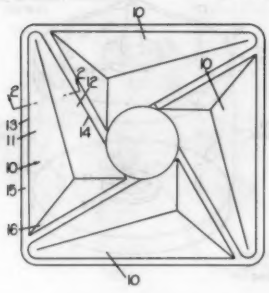
Filed May 12, 1971, Ser. No. 142,455

Int. Cl. B23p *15/30*

U.S. Cl. 29—95 R **7 Claims**

A throw away tip for a metal cutting tool comprising a right prism of hard material, each end face of the prism having at

least two identical cutting corners and being formed with a plurality of tapering recesses of V-shaped section each recess



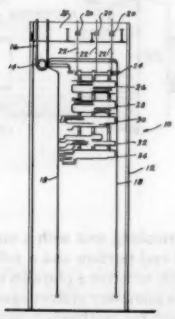
having its narrowest end adjacent one of said cutting corners of the associated end face.

3,751,783

METHOD OF ERECTION OF HORIZONTAL SURFACED HEAT TRANSFER MODULES FOR STEAM GENERATING UNITS

James C. Roberts, Jr., Avon, and Hersey B. Nelson, Granby, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed June 22, 1971, Ser. No. 155,460
Int. Cl. B23p *15/26, 19/00*
U.S. Cl. 29—157.4 3 Claims



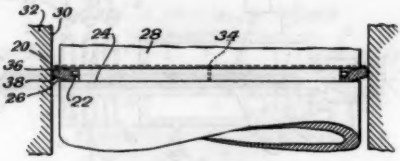
A method of erection of heat transfer module sections for horizontal surfaced steam generating units wherein hydraulically operated jacks are placed on the overhead structure in the permanent hanger line. Threaded rods extend through the jacks to the grade elevation where they are attached to the permanent hanger system. The heat transfer modules which may be superheater, reheater or economizer sections are individually brought into the furnace cavity and put together at grade elevation raising each module just high enough to bring in the next module for connection to the preceding module until the total surface is assembled. The jacks are then run up to the fully erected position for the total surface arrangement and the permanent hanger system installed to the furnace structural support.

3,751,784

MANUFACTURING PROCESS FOR PISTON ENGINES HAVING COMPRESSION RING SEALING

Norman M. Packard, Des Plaines, Ill., assignor to International Harvester Company, Chicago, Ill.

Division of Ser. No. 757,973, Sept. 6, 1968, Pat. No. 3,587,155. This application June 24, 1971, Ser. No. 156,558
Int. Cl. B23p *15/00*
U.S. Cl. 29—156.4 R 5 Claims



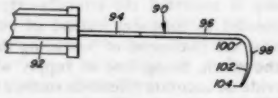
Manufacture of engines having grooved pistons and sealing rings fitting in the grooves of the pistons comprising: selection, by means of a selection-rejection process from a plurality of torsion type split compression rings, of rings for the grooved pistons each having at least the first one of its two opposite sides, in the free spring state of the ring, provided with a consistent overall flatness to at least about 10 to 5 light bands and, in the collapsed state with the ring closed or substantially so, said first side being frusto conical and so arranged with respect to the back of the ring that the intersecting portion of the inner periphery of the first side is substantially coplanar at all points on the periphery; sealing said pistons with such compression rings including those rings as so selected, by installation of a ring in an associated compression ring groove on each piston with an associated side of the groove confronting in the described way the first side of the ring; and construction of said engines by assembling such pistons in the respective cylinders with the face of each ring engaging a cylinder wall at all times to retain the ring in collapsed state on the piston, and with the ring effective during engine operation to establish a substantially continuous pressure ring of at least line contact between the coplanar inner periphery of said frusto conical first side and its associated confronting groove side to seal the piston.

3,751,785

TOOL FOR REMOVING MOLDINGS

Morris W. Whitesell, P.O. Box 636, Waynesboro, Va.

Filed May 25, 1971, Ser. No. 146,681
Int. Cl. B23p *19/04*
U.S. Cl. 29—267 10 Claims



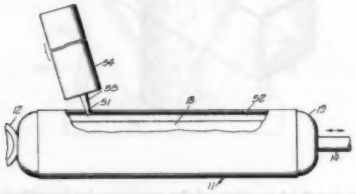
A special purpose tool is disclosed for use in removing metal moldings from around the windshield or back light of automobiles in which the molding is secured by means of metal spring fasteners. The tool comprises an elongated metal blade terminating at its outer end in a tip portion curved to form an arcuate fulcrum, the outermost end of the tip being tapered so that it may be inserted between the molding and the automobile metal work. The tip portion forms approximately a right angle with the plane of the blade, and is sufficiently long to extend past the edge of the molding when the tool is in place, whereby upward movement of the handle of the tool will cause the tip to pivot against the metal work of the automo-

bile, with the end of the tip pressing against the fastener and releasing the molding.

3,751,786
METHOD AND SERVICE KIT FOR REVITALIZING SHOCK ABSORBERS

Thomas R. Lyon, 521 Terrado Dr., Monrovia, Calif.

Filed Sept. 3, 1969, Ser. No. 854,868
Int. Cl. B23p 7/00
U.S. Cl. 29—401 **6 Claims**

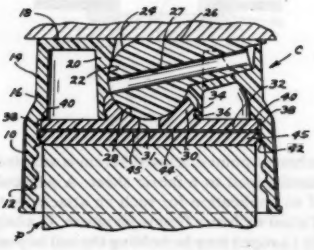


A method and kit accessories useful in extending the service life of a permanently assembled shock absorber. The kit includes a boring tool, one or more self-tapping plugs and a container of sufficient fluid to replace the original fluid charge and having a viscosity effective to substantially restore the original operating characteristics of the shock absorber. The invention also includes a permanently assembled shock absorber revitalized without need for disassembly.

3,751,787
METHOD OF MOUNTING A SEALING DISC IN A CAP FOR A CONTAINER

Alvin J. Porter, Minneapolis, Minn., assignor to Product Design & Engineering, Inc., Minneapolis, Minn.

Filed Feb. 1, 1972, Ser. No. 222,536
Int. Cl. B23p 17/00
U.S. Cl. 29—421 R **6 Claims**

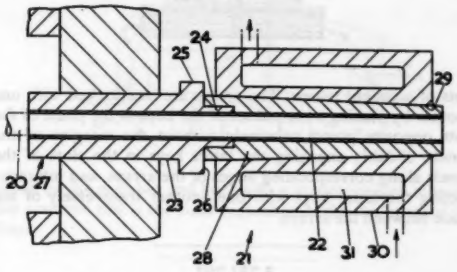


The method of mounting a sealing disc in a cap of a container having an open neck which consists in providing in the cavity of the cap and on the bottom of the cavity of a disc portion adapted to overlie the outer edge of the neck of the container with the sealing disc between the neck and the disc, constructing the cap with an inner perimetric groove extending outwardly of the disc, providing a plunger constructed with a portion at one end of compressible material with an upper end surface thereof conforming in configuration to the exposed surface of the disc of the cap and spaced laterally about its perimeter from the bottom of the perimetric groove bounded by a perimetric rib, a distance greater than the thickness of the sealing disc, in placing between said cap disc and the denoted end of said plunger a sealing disc blank having a peripheral flange with the peripheral flange about the end of the plunger and forcing the plunger into the cap with sufficient pressure to cause lateral movement of the peripheral flange portion of the sealing disc into the inner perimetric groove and within the perimetric rib of the cap to mount the flange therein and thereby mount the sealing disc in the cap.

3,751,788
METHOD OF MANUFACTURING A REFRACTORY LINED CONTINUOUS CASTING DIE

Robert King, Sutton Coldfield, England, assignor to Imperial Metal Industries (Kynock) Limited, Birmingham, England

Division of Ser. No. 775,774, Nov. 14, 1968, abandoned. This application Aug. 20, 1971, Ser. No. 173,556
Int. Cl. B22c 9/06
U.S. Cl. 29—423 **2 Claims**

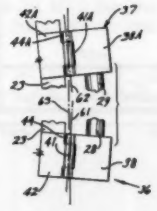


A method of manufacturing a die for the continuous casting of metals comprising depositing a layer of refractory material on a disposable mandrel, depositing a support of thermally conductive material around and in intimate contact with the outer surface of the layer, and subsequently removing the mandrel.

3,751,789
METHOD FOR HINGING A FOLDABLE TABLET ARM TO A STACKABLE CHAIR

Roy W. Fink, Portage, Mich., assignor to The Vecta Group, Inc., Kalamazoo, Mich.

Division of Ser. No. 108,511, Jan. 21, 1971, Pat. No. 3,712,668. This application Sept. 15, 1972, Ser. No. 289,427
Int. Cl. B23p 11/00, 11/02; A47b 39/00
U.S. Cl. 29—434 **2 Claims**



A Method For Applying Torque To Support Members For A Foldable Tablet Mounted On An Arm Of A Stackable Chair.

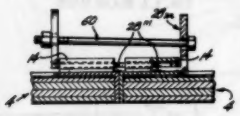
3,751,790
CONSTRUCTION OF A FORM FOR CONCRETE MOLDING

Stanley J. Frazier, 3206 S. Fudson St., Seattle, Wash.

Division of Ser. No. 77,935, Oct. 5, 1970, Pat. No. 3,687,411. This application Feb. 7, 1972, Ser. No. 224,322
Int. Cl. B21d 39/00; B23p 19/04
U.S. Cl. 29—455 **6 Claims**

A readily assembled and readily stripped, reusable concrete form is constructed from a plurality of similar flat-faced panels having spaced, co-planer, open-ended edge-oriented slots in the margins of the other or opposite faces thereof; and a plurality of elongated L-shaped keys which are employed both to interlock the panels on each side of the form, and to interlock

the form from side to side. The panels are arranged in two spaced, parallel, oppositely disposed, edge to edge, co-planer flat-faced array of the same; and are interlocked with one another in each array by placing a first set of the keys in the plane of the slots opposite points relatively within the margins of the panels, and slidably engaging the keys in the adjacent



slots of adjacent panels. The arrays are interlocked with one another by placing a second set of the keys in the plane of the slots opposite points relatively without the margins of the panels, slidably engaging the latter keys in the slots of the panels along corresponding edges of the arrays, and interconnecting the latter keys with one another transversely of the space between the arrays.

3,751,791

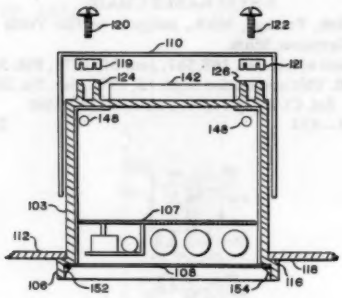
METHOD FOR MOUNTING A PANEL METER

Joshua Horwitz; Bernard M. Gordon, both of Magnolia, and Brant W. Becker, Sudbury, all of Mass., assignors to Gorclan Engineering Company, Wakefield, Mass.

Division of Ser. No. 852,808, Aug. 25, 1969, abandoned. This application Mar. 17, 1971, Ser. No. 125,215

Int. Cl. B23p *21/00*

U.S. Cl. 29—469 **4 Claims**



In a bipolar floating input device, particularly for dual-slope integration digital panel meters, an analog voltage is applied to a bipolar floating input circuit and a digital form of the analog voltage is presented by a display.

3,751,792

METHOD OF FORMING A WELDED JOINT CONSTRUCTION

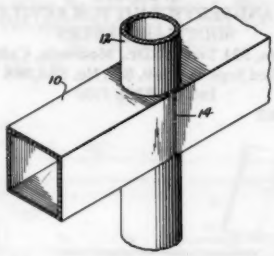
Paul V. Frakes, Williamsport, Pa., assignor to The Gazer Corporation, Williamsport, Pa.

Filed June 23, 1971, Ser. No. 155,806

Int. Cl. B23k *31/02*

U.S. Cl. 29—471.1 **7 Claims**

A welded joint construction for tubular members and a method of welding the same whereby a horizontal member of substantially rectangular cross section is radially notched to partially accommodate a vertically oriented cylindrical member having an outside diameter approximately equal to the inside width of the rectangular member whereafter the cylindrical member is positioned within the partially accommodating notched portion of the rectangular member and the vertical edges of the rectangular member are welded to the face of the cylindrical member juxtaposed thereto.



3,751,793

METHOD OF FORMING ATTACHMENT POINT ON THE CORNER OF A FABRIC SHEET

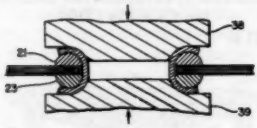
Harry T. Davis, West Peabody, Mass., assignor to Hood Sailmakers, Inc., Marblehead, Mass.

Division of Ser. No. 74,773, Sept. 23, 1970, Pat. No. 3,653,353.

Filed Jan. 3, 1972, Ser. No. 214,820

Int. Cl. B21d *39/00*; B23p *11/02*

U.S. Cl. 29—523 **4 Claims**



The attachment point disclosed herein is adapted for applying a substantial load to a fabric sheet. A particularly fitting example of an application for such an attachment point is at the clew of a sail such as a Genoa jib where, in a large sailboat, the jib sheet (a rope) may be holding the sail in position under a load of several hundreds to several thousands of pounds. The attachment point employs a pair of complementary ring members, each having a multiplicity of needle-like teeth. These ring members are clamped on opposite sides of a plurality of cloth layers by means of a metallic inner liner which is rimmed down over the ring members so as to apply a clamping force sufficient to prevent combing of the teeth through the cloth layers under a lateral pressure in the same order of magnitude as the strength of the cloth layers themselves.

3,751,794

PANEL ASSEMBLY AND MACHINE

Charles Kay, 6355 Thornapple River Dr., Alto, Mich.

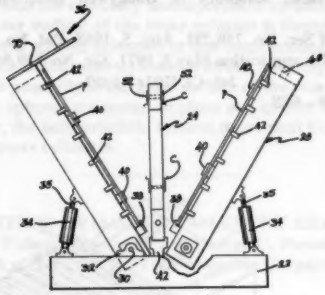
Filed Aug. 13, 1971, Ser. No. 171,564

Int. Cl. B23p *19/00*

U.S. Cl. 29—526 **12 Claims**

A method and apparatus for making structural building units from a pair of spaced panels and interconnecting metal plates, the plates being inserted by means of powered plate inserting means and powered panel holding means wherein the

plates are first positioned into recesses formed in the inner facing portions of the panels and then forced endwise into the panel.



Also disclosed are various panel-joining plates having specially configured end portions to ensure positive holding action between the plates and panels.

3,751,795

METHOD OF MAKING BEZELS FOR SETTING PRECIOUS STONES

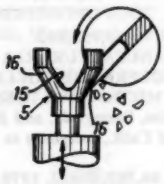
Henri Victor Favre, 44, rue du College, 39-Saint-Claude, France

Continuation-in-part of Ser. No. 854,641, Sept. 2, 1969, abandoned, which is a continuation-in-part of Ser. No. 631,978, April 19, 1967, abandoned. This application Feb. 8, 1972, Ser. No. 224,492

Claims priority, application France, Apr. 28, 1966, 6659538; Oct. 4, 1966, 6678730

Int. Cl. B23p *13/04*

U.S. Cl. 29—558 **4 Claims**



This method of manufacturing bezels for setting precious stones or the like comprises the steps of turning a stock rod in order to form a hollow head followed by a narrow stem therein, milling the lateral wall of the head with a cutter, and severing the stem from the remaining portion of the rod by cutting, so as to obtain a high-precision bezel having a perfect finish. (FIG. 7a).

3,751,796

METHOD AND APPARATUS FOR BONDING AN ELEMENT TO A CONICAL SURFACE

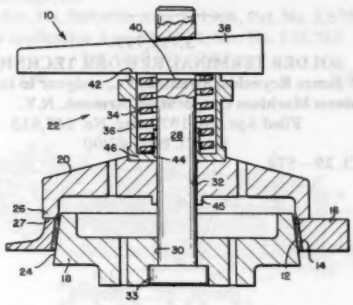
Walter R. Wise, Pittsford, N.Y., assignor to Garlock Inc., Palmyra, N.Y.

Filed May 26, 1972, Ser. No. 257,229

Int. Cl. B23q *7/00*; B23p *19/00*

U.S. Cl. 29—559 **17 Claims**

An installation fixture for use in holding, for bonding purposes, an annular, conical, liner against a conical surface of a member to which the liner is to be bonded, and for applying the same pressure each time regardless of variations in the thickness of the liner from one liner-member piece to the next. The fixture includes a stationary base having a conical receiving surface, (on either an inside or outside diameter surface), a movable cap and a spring arrangement for forcing the cap



down on the member and liner with a predetermined repeatable pressure that is the same regardless of the thickness of the liner.

3,751,797

METHOD OF MAKING A CAPACITOR HAVING A SELF-DEPOLARIZING ELECTROLYTE

Thomas C. O'Nan; Charles W. Walters, and James M. Booe, all of Indianapolis, Ind., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Division of Ser. No. 862,049, Sept. 29, 1969, Pat. No. 3,601,665. This application Feb. 12, 1971, Ser. No. 115,040

Int. Cl. H01g *9/02*

U.S. Cl. 29—570 **13 Claims**

A method of making a self-depolarizing, silver cathode, sulfuric acid electrolytic capacitor, wherein silver sulfate is provided in the electrolyte by providing in the electrolyte a metal sulfate which etches the silver cathode.

3,751,798

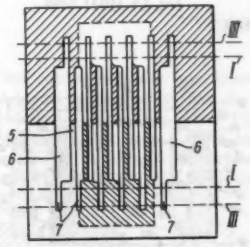
METHOD OF MAKING THERMOPILES OF FOIL

Yakov Avramovich Altshuler, ulitsa Bokovaya Veresaeva 5, kv. 3, Lvov, U.S.S.R.

Filed Feb. 23, 1972, Ser. No. 228,589

Int. Cl. B01j *17/00*

U.S. Cl. 29—573 **6 Claims**



A method of making a thermopile in which a sheet of foil of one material is connected to a sheet of foil of another material so that these sheets are placed at both sides of a line of their connection thus forming a plate; next, apertures are cut in this plate which terminate in slots at two diagonally opposite angles so that two plates with thermocouples, formed by the partitions between the apertures are obtained, which plates are then piled up in such a manner that the sheet of foil of one material of one plate adjoins the sheet of foil of another material of the other plate and the slots in both plates coincide; the two plates are connected within the zone of the slots whose width is equal to the gap between the thermocouples;

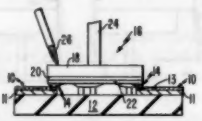
plates are attached to a framework and the ends of the sheels are cut off beyond the places of their connection, thereby obtaining a thermopile of a number of series connected thermocouples.

3,751,799

SOLDER TERMINAL REWORK TECHNIQUE

Jerald James Reynolds, Swanton, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 26, 1972, Ser. No. 247,613
Int. Cl. B01j *17/00*
U.S. Cl. 29—574 **10 Claims**



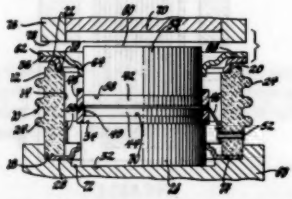
Excess solder is removed from contact elements to which a semiconductor device or integrated circuit chip is to be bonded on a multiple chip carrying substrate, without damaging chips solder bonded to adjacent contact elements. Typically, a chip not functioning according to test specifications is removed by reflowing its solder bonds in a carefully controlled heat cycle, then lifting it from the contact elements. The present process removes excess solder left behind by the removed chip. A layer of solderable metal is deposited on a member essentially duplicating the heat transfer characteristics of the chip. The excess solder is contacted with the solderable metal layer. The excess solder is heated to reflow temperatures in a heat cycle duplicating that used for reflowing the solder bond. The member simulating the chip is then removed, carrying with it the excess solder and restoring the contact elements to proper condition for receiving a replacement chip, without damage to adjacent chips.

3,751,800

METHOD OF FABRICATING A SEMICONDUCTOR ENCLOSURE

Dale L. Daniels, Kokomo, and Thomas J. Furnival, Logansport, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 60,865, Aug. 4, 1970, Pat. No. 3,688,163.
This application Mar. 27, 1972, Ser. No. 238,373
Int. Cl. H01l *7/00*
U.S. Cl. 29—589 **4 Claims**



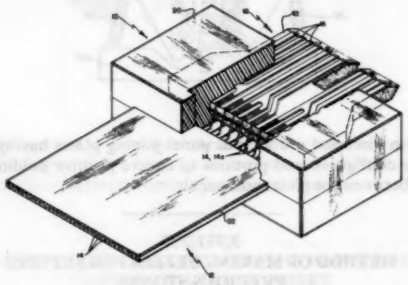
A hermetically sealed enclosure for a semiconductor device and method for making same which includes providing a tubular ceramic housing with a circumferential integral cold welding die on one end face thereof. A cold weldable layer is bonded to the one end face of the housing, with a portion of the layer overlying the die. A first cover member is cold welded to the layer over the die to provide a hermetic seal at the die end and a first electrical and thermal contact. A second cover member hermetically encloses the end opposite the integral die and provides an electrical and thermal contact at the opposite end of the housing.

3,751,801

METHOD AND APPARATUS FOR TERMINATING ELECTRICAL RIBBON CABLE

Everhardt P. Praeger, and Brian A. Wolfset, both of Framingham, Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 750,291, Aug. 5, 1968, Pat. No. 3,605,060.
This application May 3, 1971, Ser. No. 139,947
Int. Cl. H01r *43/00*
U.S. Cl. 29—628 **8 Claims**



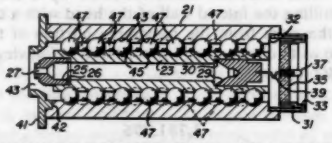
A new termination, with which a miniature ribbon cable can be connected readily to other electrical devices, has adjacent cable conductors connected without fan-out to a connector plate having contacts on opposite sides of a board-like insulator. The cable insulation is removed from the conductors, prior to assembly of the cable with the connector plate, preferably along the entire conductor length that overlies the insulator.

3,751,802

METHOD OF MANUFACTURING A CERAMIC BALL INSULATED DEPRESSED COLLECTOR FOR A MICROWAVE TUBE

Robert Leander Holm, Sunnyvale, and John Wesley Ashford, Los Altos, both of Calif., assignors to Litton Systems, Inc., San Carlos, Calif.

Division of Ser. No. 94,387, Dec. 2, 1970, Pat. No. 3,679,929.
This application Feb. 16, 1972, Ser. No. 226,723
Int. Cl. H01p *11/00*
U.S. Cl. 29—600 **15 Claims**



In an improved depressed collector assembly for a microwave tube a pair of metal cylindrical members are arranged concentrically, one within the other, and in that relationship are supported spaced apart and electrically insulated from one another by a fill of dielectric ceramic balls or spheres, suitably aluminum oxide or beryllium oxide, located within and about and along the space between the cylinders. The spheres are maintained therein embedded in identations in the opposed walls of the cylindrical members. The inner cylinder forms the major part of the depressed collector electrode which is in the tube maintained at a high voltage, and the

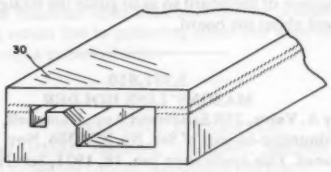
outer cylinder forms the collector shield maintained at a much lower voltage, normally ground. In the novel method of fitting such ceramic spheres between the inner and outer metal cylinders the annular space between the concentric cylinders is first filled with the relatively incompressible ceramic spheres, and the outer surface of the inner cylinder is forced outward to embed said spheres primarily in that outer surface while the inner surface of the outer cylinder is forced inwardly to embed the spheres primarily in the inner surface of the outer cylinder so that the spheres are seated in place and cannot move and, conversely, the balls preclude relative movement between the inner and outer cylinders.

3,751,803

METHOD OF MAKING A MAGNETIC HEAD

Robert D. Fisher, Woodstock, and George C. Puram, Saugerties, both of N.Y., assignors to Ferroxcube Corporation, New York, N.Y.

Filed May 16, 1972, Ser. No. 253,796
Int. Cl. G11b *5/42*
U.S. Cl. 29—603 **12 Claims**



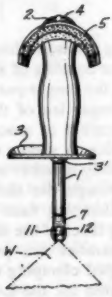
A recording head and a method of manufacturing a recording head wherein capillary techniques are employable for gap formation without compression by means of a pre-bonded head structure. By use of sputtering techniques, the correct gap length can be set into the recording head.

3,751,804

DEBURRING TOOL

Earl J. Pulrang, Seattle, Wash., assignor to Roy S. Rubrang, Kent, Wash.

Filed Mar. 8, 1971, Ser. No. 121,674
Int. Cl. B26b *3/00*
U.S. Cl. 30—169 **12 Claims**



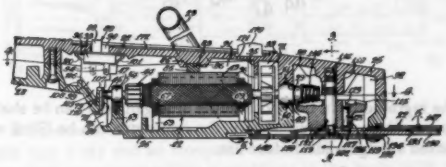
A grip has a tool shank projecting lengthwise from one end which carries a bit having a ring forming an eye with it axis extending transversely of the tool shank through its tip or a pair of skiving disks. The leading edge of the eye ring rim is sharpened to provide a concave arcuate cutting edge to straddle a workpiece ridge. The skiving disks are located in adjacent coplanar relationship to form a saddle slot between them for straddling a work sheet edge which will chamfer its two corner ridges. The upper end of the grip carries a brace rod having a wrist-engaging saddle. The lower grip end carries a guard plate.

3,751,805

HEDGE TRIMMER

Robert D. Grahn, Hinsdale, Ill., assignor to Sunbeam Corporation, Chicago, Ill.

Division of Ser. No. 569,490, Aug. 1, 1966, Pat. No. 3,579,827.
This application Apr. 29, 1971, Ser. No. 138,765
Int. Cl. B26b *19/02*
U.S. Cl. 30—220 **7 Claims**



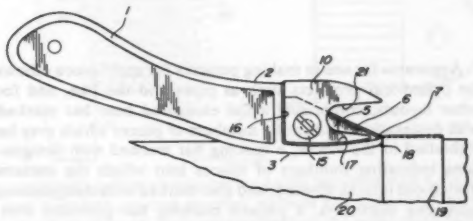
An electric motor driven hedge trimmer having an elongated split housing and a forwardly extending reciprocating cutter and comb assembly. The split housing forms a gear chamber above a portion of the cutter and comb assembly and supports a stationary post at one end. The post rotatably supports one of the gears through which the cutter assembly is driven. The comb which is disposed below the reciprocating cutter supports the other end of the stationary post and the cutter is provided with a slot to provide clearance for the post. A saw blade is attached to the end of the cutter remote from the housing. The rear portion of the housing provides a handle and a transversely disposed loop-shaped handle is also provided. A level gauge is secured on top of the housing.

3,751,806

TAPE CUTTER

John Patrick, 233 N. Ward St., Macomb, Ill.

Filed May 20, 1971, Ser. No. 145,432
Int. Cl. B26b *3/08*
U.S. Cl. 30—294 **1 Claim**



A tape cutter for cutting adhesive tape from human skin having a pointed blade positioned so that the point of the blade is near a rounded tip on the tape cutter. The blade being held in a guide extension that has an open area above the blade to force the tape to be cut against the blade and a bottom rounded portion to force the skin down and away from the tape to be cut.

3,751,807

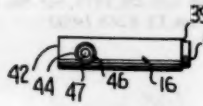
DENTAL INSTRUMENT

Carroll G. Noll, 4196 Abinadi Rd., and Alvan M. Morris, 7148 Loch Lomond Dr., both of Bethesda, Md.

Filed Mar. 3, 1972, Ser. No. 231,681
Int. Cl. A61c *3/10*
U.S. Cl. 32—52 **15 Claims**

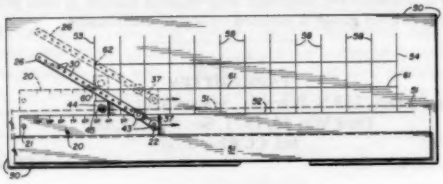
A dental instrument for dispensing tooth filling material into a cavity and for compacting the filling material in the cavity. The compacting element of the instrument ejects the tooth filling material and then closes a dispensing opening of the filling material container so the instrument can be used to compact the dispensed filling material. The container and compacting element are releasably secured to the instrument

as a unit with the compacting element closing the dispensing opening of the container. The container can be prefilled with



the ingredients of the tooth filling amalgam and can be shaken to mix same, or alternatively, the container can be filled with mixed amalgam just before use.

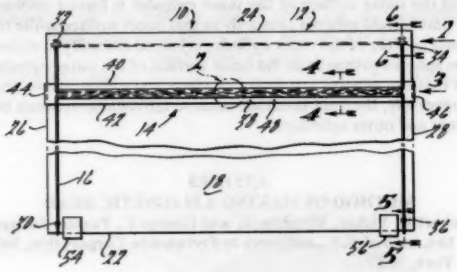
3,751,808
APPARATUS FOR USE IN MAKING PATTERNS FOR ELBOWS FOR CYLINDRICAL PRODUCTS, AND OTHER LAYOUTS
James D. Price, 635 Joyce St., Golden, Colo.
Filed Aug. 23, 1971, Ser. No. 174,067
Int. Cl. B43l 7/06
U.S. Cl. 33—75 R **4 Claims**



Apparatus for use in making patterns for multi-piece elbows for cylindrical products such as pipes and the like, and for other layouts, comprising a flat elongated base bar marked with designations indicating numbers of pieces which may be embodied in the elbow, a spacing bar marked with designations indicating numbers of spaces into which the pattern stretch-out is to be divided, and also marked with designations indicating diameters, a pattern marking bar provided with holes arranged in rows for coinciding with space indicating lines on the pattern and for marking intersection lines as a guide to drawing the pattern, a pair of short bars, and means connecting bars in certain combinations and angular arrangements for use in dividing the pattern into a selected number of equal spaces, for establishing throat and pitch lines, and for marking intersections as a guide to drawing the pattern. The apparatus is useful for both "parallel line development" and "radial line development," and is not limited to making elbow patterns.

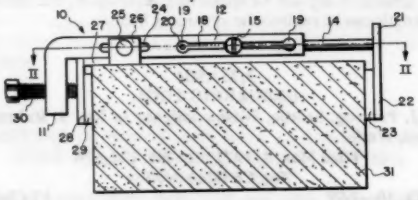
3,751,809
PORTABLE DRAFTING APPARATUS
William F. Burgess, Jr., 1314 Penobscot Bldg., Detroit, Mich.
Filed May 6, 1971, Ser. No. 140,696
Int. Cl. B43l 5/00, 13/02
U.S. Cl. 33—80 **5 Claims**

There is herein disclosed a new and novel portable drafting apparatus comprising a board, a straightedge slidably supported on the board and consisting of an elongated blade of substantial width and having parallel longitudinal drawing instrument guiding edges, an elongated crown unit having a longitudinal tunnel for housing crossed portions of a guiding cord and mounted on the top surface of the blade and a stationary guiding cord secured at the bottom of the board and extending



throughout the entire length of the crown unit and under the upper surface of the board so as to guide the straightedge in its movement about the board.

3,751,810
MASONS' LINE HOLDER
Anthony A. Valva, 298 Sanderson Ave., Campbell, Ohio
Continuation-in-part of Ser. No. 873,386, Nov. 3, 1969, abandoned. This application Jan. 18, 1971, Ser. No. 107,143
Int. Cl. E04g 21/18
U.S. Cl. 33—86 **8 Claims**

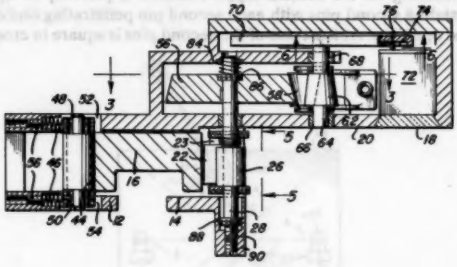


A device for securing a masons' line to a brick or block wall. The line holding device consists of a L-shaped body member and a L-shaped clamp, the longer portion of which is slideably received within the longer leg of the body member and is secured in any of a number of spaced positions to vary the overall span of the device. A sliding clamp is mounted on the longer portion of the body member and is forced by means of a screw extending through the short portion of the body member toward the clamping face of the L-shaped clamp member. The clamping faces of the sliding member and of the L-shaped clamping member are provided with renewable rubber faces. A U-shaped clamping member is also provided which may be substituted for the L-shaped clamp to permit the device to be clamped to the side wall of a concrete block.

3,751,811
MEASURING DEVICE
Paul Pajevic, 475 N. Northwest Hwy., Park Ridge, Ill.
Filed Sept. 15, 1971, Ser. No. 180,561
Int. Cl. G01b 3/12
U.S. Cl. 33—141 R **24 Claims**

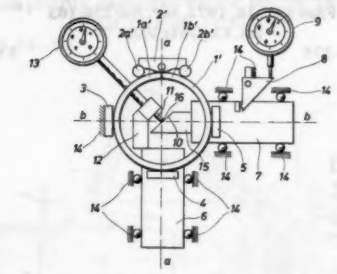
A friction wheel measuring apparatus for measuring distances traveled along a machine surface, said apparatus including a counting wheel with a circular groove containing a

continuous number of balls each of which actuates a counting mechanism during rotation of the counting wheel, said counting wheel being driven by tapered motion transfer rollers



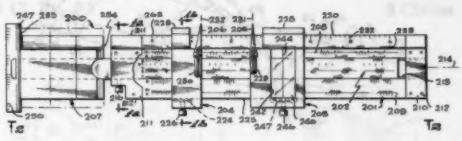
which are axially adjustable with respect to each other to change the diameter ratio therebetween for compensation of measuring errors due to gathering effect and wear of the internal parts over a period of time.

3,751,812
MEASURING APPARATUS
Franz-Josef Meyer, Opladen, Germany, assignor to Goetzewerke Friedrich Goetze, Burscheid, Germany
Filed May 19, 1971, Ser. No. 144,785
Claims priority, application Germany, May 20, 1970, P 20 24 461.5
Int. Cl. G01b 5/08, 5/00
U.S. Cl. 33—178 R **7 Claims**



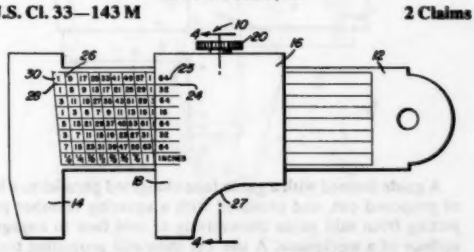
Apparatus for measuring the outer diameter and ovality of out-of-round articles has a first defined axis of movement and first displaceable means mounted for movement along that axis, a second defined axis of movement different from the first axis and second displaceable means mounted for movement along the second axis. A counterjaw is mounted on the first displaceable means for movement therewith and cooperates with a separate pivotally mounted jaw. The pivotally mounted jaw and the separate counterjaw are arranged for measuring the ovality of an out-of-round article to be measured. A jaw is mounted on a second displaceable means for movement therewith and cooperates with a fixed jaw for measuring the outer diameter of the article to be measured. A member is mounted on the first displaceable means which defines a surface inclined at 45° with respect to the second axis. Means having a sensing tip is mounted on the first displaceable means and arranged perpendicularly with respect to and in contact with the inclined surface for measuring the ovality of the article to be measured.

3,751,813
SLIDE RULE AND COMPASS DEVICE
Edward A. Kuwada, 1053 S. Kingsley Dr., Los Angeles, Calif.
Filed Nov. 11, 1971, Ser. No. 197,791
Int. Cl. B43l 9/04
U.S. Cl. 33—27 C **15 Claims**



A combined slide rule and compass device including a slide rule type body and an elongated main slide mounted for longitudinal movement within a guideway in the body, with two external slide elements being disposed about the body and carrying a pair of compass points which are adjustable toward and away from one another for use in drawing or measuring circles. One of these external slides also carries a hairline for coaction with the scales on the body and main slide in making a slide rule calculation. Preferably, the main slide has an enlarged head at one of its ends, which may be detachable from the main slide and onto which at least one and preferably both of the external slides are movable to a retracted position in which they do not interfere with use of the device as a conventional marking or measuring ruler.

3,751,814
SLIDE CALIPER
Howard H. Crawford, 206 Raynolds, El Paso, Tex.
Filed Sept. 28, 1971, Ser. No. 184,529
Int. Cl. G01b 5/00
U.S. Cl. 33—143 M **2 Claims**

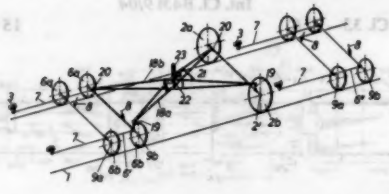


A slide caliper device having a rule provided with a plurality of inscribed, spaced, parallel, vertical and horizontal lines on the face thereof. Numerals indicating the numerator of fractional distances are inscribed in the spaces created by the vertical and horizontal lines. A slidable member or indicator engages the rule and also has indicia and numerals inscribed thereon indicating the denominator of fractional lengths. When the indicia of the indicator is moved to the point of intersection of horizontal and vertical lines on the rule, a direct reading between end portions of the rule and indicator is obtained.

3,751,815
MOBIL TRACK SURVEY APPARATUS FOR DETERMINING THE TRACT CAMBER
Franz Plasser; Josef Theurer, both of Vienna, and Manfred Schweinhammer, Deutsch-Wagram, all of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegellschaft m.b.H., Vienna, Austria
Filed June 23, 1971, Ser. No. 155,852
Claims priority, application Austria, July 9, 1970, 6270
Int. Cl. G11b 9/08
U.S. Cl. 33—146 **3 Claims**

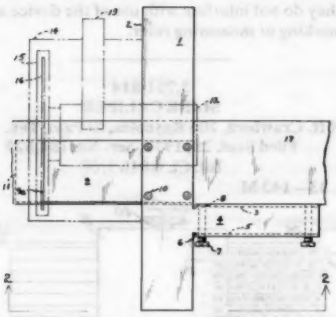
Two sensing elements each having two sensing members respectively engaged with the two rails and spaced apart in the

track elongation direction survey the vertical positions of the rails to determine the track camber. Two link elements respectively interconnect opposite sensing members of the



respective sensing elements. An electric measuring signal generator is connected between the two links and transmits to an indicator an electric measuring signal proportional to any movement between the two links relative to each other.

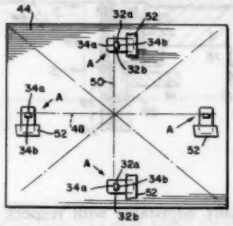
3,751,816
GUIDE FOR HAND-HELD ELECTRIC SAW
George W. Hayes, 15032 Regina, Allen Park, Mich.
Filed June 7, 1971, Ser. No. 150,295
Int. Cl. B27g *19/04*
U.S. Cl. 33—185 R **1 Claim**



A guide formed with a guide face elongated parallel to a line of proposed cut, and provided with a squaring member projecting from said guide transversely to said face to engage a surface of a workpiece. A saw cut indicator projecting transversely to said guide face in the direction opposite from said squaring member, and terminating in a saw cut indicating edge predeterminedly spaced from and parallel to said guide face, said saw cut indicator being made of a material of some permanence, but readily cut by a saw blade, so that on an initial cut using a specific electric saw, the blade will permanently establish the saw cut indicator edge for that particular saw. Screws threadedly received in said squaring member and adjustable to establish angular divergency between said squaring member and the surface of a workpiece engaged thereby and consequently a corresponding divergency of a saw cut.

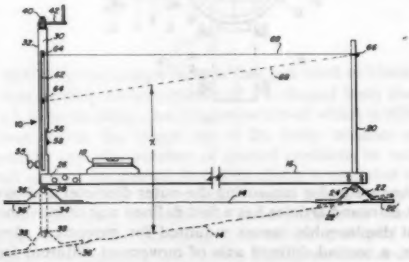
3,751,817
METHOD OF REGISTERING FILM NEGATIVES
Lyle G. Willis, 19261 S. W. 93rd Rd., Miami, Fla.
Filed Aug. 19, 1970, Ser. No. 64,965
Int. Cl. B41b *1/00*
U.S. Cl. 33—184.5 **9 Claims**

The method of establishing accurate registry of one or more superposed flexible sheets relative to first and second support surfaces whereby the sheets can be removed from the first support surface and placed in proper registry on the second support surface. The method comprises the steps of defining in a first sheet a plurality of elongated, rectangular openings, placing the sheet on the first support surface and firmly anchoring on the first support surface a plurality of upstanding first pins of corresponding elongated rectangular cross section with each first pin conformingly penetrating one of the openings, removing the sheet from the first support surface and placing it on the second support surface and firmly anchoring on the second support surface a plurality of upstanding second pins with each second pin penetrating one of the openings. At least one of the second pins is square in cross



section with a transverse side dimension equal to the length of the shorter side of the rectangular openings, whereby the sheet can expand or sweep in the direction of the longer sides of the opening penetrated by the square pin. Subsequently, any other sheet provided with openings for snugly receiving, respectively, the first pins on the first support surface can be transferred to the second support surface and registered with the first sheet.

3,751,818
INSTRUMENT FOR CHECKING AND DETERMINING THE GRADE AND SLOPE OF A SURFACE
Kyle Clifton Eller, Jr., P.O. Box 868, Statesville, N.C.
Filed Feb. 14, 1972, Ser. No. 226,103
Int. Cl. G01c *9/28*
U.S. Cl. 33—375 **5 Claims**



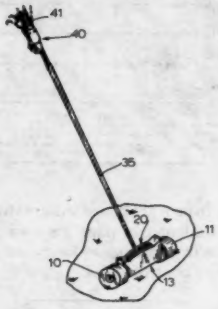
An instrument for checking the grade and slope of a surface, such as a road bed, which includes a pair of spaced vertical stanchions interconnected by a horizontally extending cross member having a spirit level mounted thereon. One stanchion member is fixed to the cross member and the other stanchion member includes a telescopically received movable element having a manually operated screw actuator to raise and lower the movable element with respect to the cross member. A cord extends tautly between points on the fixed stanchion member and the movable element, respectively, these points being spaced equidistant from the supporting surfaces of the foot members of the fixed stanchion member and the movable element, respectively.

3,751,819

DEVICE FOR INDICATING SLOPE OF GREEN ON GOLF COURSE

Harry F. Dixon, L-1 Atlantic St., Durham, N.C.

Filed May 14, 1971, Ser. No. 143,546
Int. Cl. G01c 9/24
U.S. Cl. 33—389 2 Claims



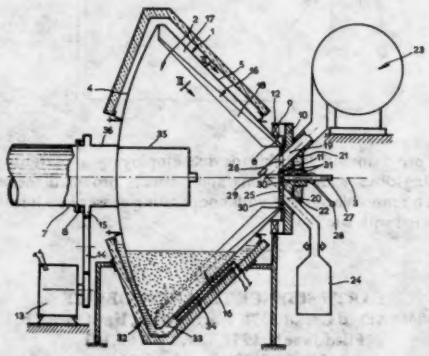
A device to be carried by a golfer for indicating during putting the slope of a golf course green incorporates a bubble type level supported on a wheeled structure secured to a handle. The level bubble is referenced to appropriate index marks so as to indicate the relative pitch or slope of the green during putting.

3,751,820

CHARGING AND DISCHARGING OF LYOPHILISATION APPARATUS

Jacques Brilloit, Grenoble, France, assignor to L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude, Paris, France

Filed Dec. 14, 1971, Ser. No. 207,933
Claims priority, application France, Dec. 16, 1970, 7045384
Int. Cl. F26b 13/30, 5/04
U.S. Cl. 34—92 10 Claims



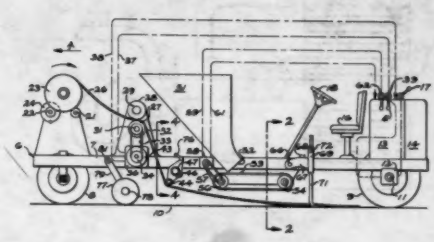
This invention relates to apparatus for lyophilising congealed or frozen product particles. Such apparatus usually comprises a box-like sublimation enclosure in which the particles are placed, and having bladed stirring means which are rotatable about an axis, together with heating means and filling and discharging conduits, one end of the discharge conduit being situated in an axial discharge zone and said conduit having an obturating member or shutter. According to this invention, the stirring means operates as a removal device in the lower part of the enclosure and has a flow gutter directed towards the said axial zone in the upper part of the enclosure. Discharge means situated close to the axial zone are also incorporated.

3,751,821

RAISIN GRAPE SPREADER

Harold P. Olmo, and Henry E. Studer, both of Davis, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Dec. 13, 1971, Ser. No. 207,133
Int. Cl. F26b 19/00
U.S. Cl. 34—93 8 Claims



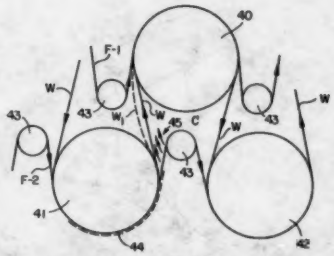
A raisin grape spreader has a carriage movable over the ground and supports a roll of paper fed from the roll at controlled rates relative to the carriage advance and laid as a strip on the ground under raisin grapes from a hopper on the carriage deposited by a feeding conveyor. Guides on the carriage temporarily lift the paper strip edges as the carriage advances, and a knife severs the strip at the end of a deposit operation.

3,751,822

WEB DRYER

Elmer E. Crist, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Dec. 17, 1971, Ser. No. 209,205
Int. Cl. F26b 13/06
U.S. Cl. 34—116 17 Claims



A web dryer structure for thermal removal of moisture from a traveling web such as a web of paper coming from the press section of a papermaking machine including a row of upper dryer drums and a row of lower dryer drums with the drums positioned to carry the web in a serpentine path successively between the upper and lower drums and the web wrapping the upper and lower surfaces of the drums, respectively, with upper and lower looped felts wrapping the webs on the upper and lower surfaces of the drums and the felts guided by felt rolls positioned intermediate the spaces between the drums so that the web is controlled by felts in all locations as it travels between the drums.

3,751,823

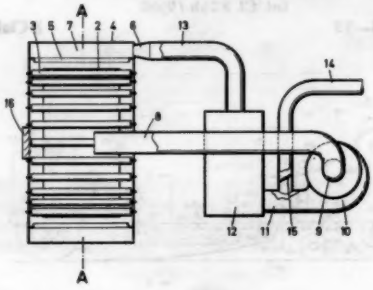
DRYING APPARATUS

Fritz Ernst Hansen, Ittigen, Switzerland, assignor to Multitec A.G., Canton of Berne, Switzerland

Filed Dec. 7, 1971, Ser. No. 205,505
Claims priority, application Switzerland, Dec. 9, 1970, 18226
Int. Cl. F26b 9/00
U.S. Cl. 34—155 10 Claims

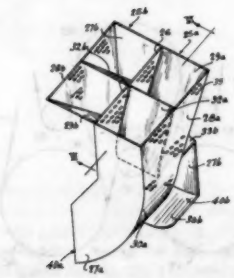
The invention concerns drying apparatus suitable for drying strip material, which comprises a drying chamber through

which strip material may be passed, a strip entrance and exit aperture in the chamber to allow passage of strip material into and out of the drying chamber, a plurality of rotatable support rolls being disposed in parallel and spaced apart relationship to define a cylindrical cage within the chamber and over



which strip material may be passed, means cooperating with the rolls of the cage to enable strip material passing thereover to be supported by a part of the peripheral surface of each roll of the cage and drying means for drying strip material passing over the rolls of the cage.

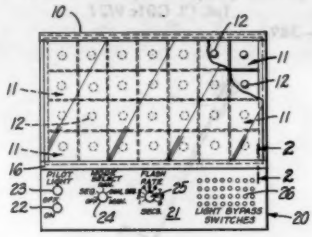
3,751,824
FLOW INVERTER FOR GRAIN DRIERS
Thomas H. Kyle, P.O. Box 194, Blenheim, Ontario, Canada
Continuation of Ser. No. 835,955, June 24, 1969, abandoned. This application Aug. 25, 1971, Ser. No. 174,966
Int. Cl. F26b *17/12*
U.S. Cl. 34—167 **12 Claims**



Flow inverter for use in a gravity flow grain drier of the type having drying chambers with perforated walls through which drying air passes. The flow inverter has two flow directing portions for separating portions of the flow of grain adjacent the air inlet wall and adjacent the air outlet wall respectively and simultaneously smoothly deflecting the separated portions laterally angularly into chutes which direct the portion separated from the flow adjacent the air inlet wall downstream adjacent the air outlet wall and direct the portion of the flow adjacent the air outlet wall downstream adjacent the air inlet wall.

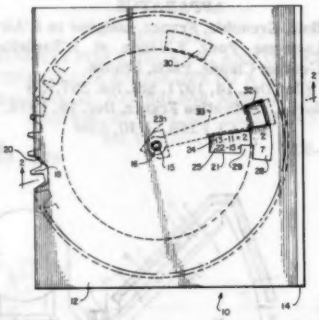
3,751,825
TEACHING OR TRAINING AID SYSTEM
Jack H. Barrett, 861 Atlanta Ct., Claremont, Calif.
Filed Mar. 2, 1971, Ser. No. 120,117
Int. Cl. G09b *13/00*
U.S. Cl. 35—6 **4 Claims**

There is disclosed herein a teaching or training aid system wherein a display array of individual illuminated indicia-covered nacelles are disposed. Each of the nacelles can be illuminated individually or in any combination, or sequence, or at any rate or frequency in response to a pre-recorded training program to operate independently, or in synchronism with pre-recorded teacher's commentary. The pre-recorded material may be changed or the control data sequences may be changed at will, or the system may be operated by the



teacher manually from a keyboard. Alternative means are provided so that a student can pace his own learning by controlling the system from a student keyboard corresponding in part to the teacher's control panel.

3,751,826
DEVICE FOR THE APPLICATION OF PRINTED LEARNING PROGRAMS
Heinz Kunert, Belvenerestr. 15, Cologne, Germany
Filed Sept. 3, 1971, Ser. No. 177,793
Claims priority, application Germany, Sept. 28, 1970, P 20 47 599.4
Int. Cl. G09b *3/02*
U.S. Cl. 35—9 F **9 Claims**

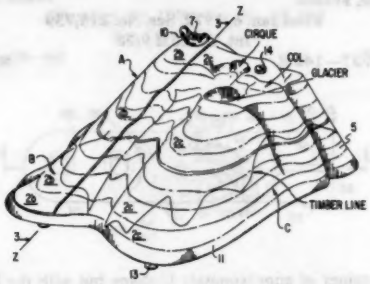


A programmed learning device employing a plurality of rotating discs with questions and answers provided thereon and an eraseable surface with cooperating eraser in a housing provided with windows.

3,751,827
EARTH SCIENCE TEACHING DEVICE
Theodore Alfred Gaskin, 378 Warren Ave., Hawthorne, N.Y.
Filed June 8, 1971, Ser. No. 151,101
Int. Cl. G09b *23/40, 25/06*
U.S. Cl. 35—10 **2 Claims**

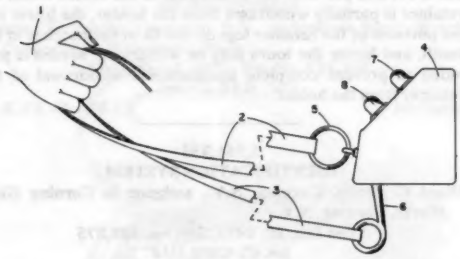
A teaching device comprising a three-dimensional model of a land mass incorporating various geological and topographical formations. The model comprises an assembly of two or more sections taken along parallel vertical planes whereby when the sections are disassembled they disclose selected illustrative subterranean formations, such as various rock strata, oil pools, mineral veins, and the like. When assembled, the outer surface of the model shows selected topographical formations. Each section is made up of matching layers, the thickness of each layer representing an increment in altitude. Thus, when the layers and sections are assembled to form the model, the edges of the faces of the contacting layers form al-

titude or elevations designated by contour lines. The model may also be utilized to illustrate the correlation between the contour lines and profile map taken on a vertical plane



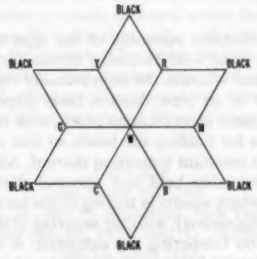
crossed by said contour lines. The individual layers may also be used as templates to draw a topographical map of the terrain at any desired elevation.

3,751,828
REIN MANIPULATION TRAINING DEVICE
Wayne W. Frame, 3300 Bridger Trl., Apt. 109, Boulder, Colo.
Filed Feb. 16, 1971, Ser. No. 115,563
Int. Cl. G09b *9/00*
U.S. Cl. 35—11 **2 Claims**



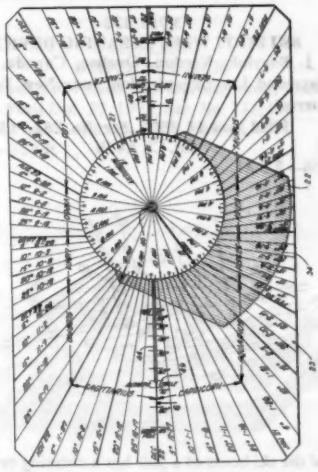
This invention relates to a training apparatus and more particularly to an apparatus for training a person to manipulate the reins of a full or double bridle as used in equitation.

3,751,829
COLOR ORDER SYSTEM
Carl E. Foss, Princeton, N.J., assignor to Kollmorgen Corporation, Hartford, Conn.
Filed Apr. 28, 1972, Ser. No. 248,454
Int. Cl. G09b *19/00*
U.S. Cl. 35—28.3 **8 Claims**



The present invention provides a series of color charts or color order system in which the colors shown in any one of the color charts are obtained by systematic variations of the combination of three or more primary colorants, and are colors that are represented by a portion of the surface of one of a series of concentric and similarly oriented cubic volumes of the color-order space. The basic color-order space is cubic and has a coordinate system of three axes, each of which represents varying amounts of one of the primary colorants. The surface of the basic color cube or any of the series of progressively smaller concentric cubes is divided into several parts by a number of planes that intersect the surfaces of the cube in such a way that each part consists of contiguous portions of more than one face of the color cube. These colors are then represented by projection in a single two-dimensional color chart.

3,751,830
ASTROLOGICAL TIME CORRECTOR
Olaf G. Brynjegard, 7433 Irondale Ave., Canoga Park, Calif.
Filed Dec. 4, 1972, Ser. No. 311,918
Int. Cl. G09b *29/00*
U.S. Cl. 35—44 **7 Claims**



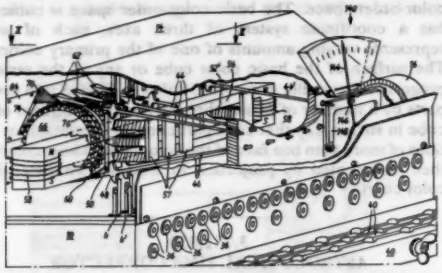
A base sheet is divided into calendar year date segments in accordance with the astrological "houses" in the plane of the ecliptic. The base sheet data is a projection at a 23°28' tilt with respect to the earth's polar axis.

A circular time chart divided at its periphery into 24 hours of the day overlies a transparent sheet divided by parallel lines extending from a line passing through the common center of both time chart and transparent sheet. Both are movable along an axis of the base sheet marked in degrees of latitude north and south of the equator. A common pivot enables the transparent sheet and the time chart to rotate with respect to the base sheet to accommodate settings for any birthdate and birth time at any birthplace latitude, and to read on the base sheet the ascendant (or rising) sign at the instant of birth.

3,751,831
APPARATUS FOR EVALUATING PUPILS REPLIES
Peter Gebhardt-Seele, Wettersteinstrasse 3, 8023 Grosshesselohe bei Munich, Germany
Filed Mar. 10, 1971, Ser. No. 122,943
Int. Cl. G09b *7/00*
U.S. Cl. 35—48 B **13 Claims**

Apparatus for grading answers of students, having a plurality of student answering stations each connected to a central recording apparatus having marking means therein controlled by one or more switches of the student station; and a recording medium in the central recording apparatus arranged to

pass by each marking means for having a marking placed thereon; and a preselecting means in the central recording ap-

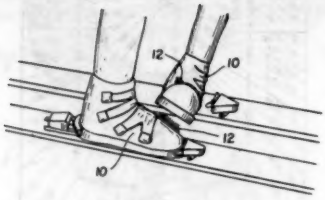


paratus which is responsive to the answering station marking means for evaluating the reply on the recording medium.

3,751,832
SKI BOOT WITH CLEANING DEVICE

Edward J. Baryluk, Verdun, Quebec, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y.; a part interest

Filed June 14, 1972, Ser. No. 262,712
Int. Cl. A43b
U.S. Cl. 36—2.5 AL 1 Claim



Each of the ski boots of a pair has a cleaning brush secured thereto to permit each boot to be cleaned with the use of the device on the other boot.

3,751,833
EXTENSION BOOT

Irvin R. Humphrey, Box 665, Sundance, Wyo.

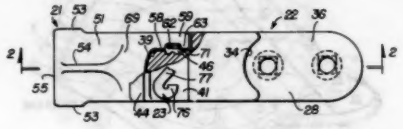
Filed Mar. 21, 1972, Ser. No. 236,752
Int. Cl. A43b 7/16
U.S. Cl. 36—81 8 Claims

An extension boot having a telescoping extension composed of sections adapted to interlock in extended position. The extension includes a sole and together with the sole of the boot, defines an enclosed chamber. Located in the chamber is a flexible air-tight bag having a valved connection to the exterior for applying air under pressure to the interior of the bag.

3,751,834
SPREAD-LEGGED STAPLE RETAINER FOR EXCAVATING TOOTH

Gerald A. Petersen, Villa Pengopin, Chemin des Salles, 06 Vence, France

Filed Jan. 6, 1972, Ser. No. 215,739
Int. Cl. E02f 9/28
U.S. Cl. 37—142 R 8 Claims

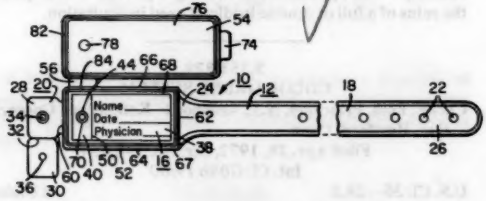


A retainer of approximately U-shape but with the legs initially slightly diverging or converging, detachably secures the proximal part of an excavating tooth within a complementary recess in its holder. The holder has holes through which the legs of the retainer fit in approximately parallel relation to each other, thereby stressing the legs from their diverging or converging position and causing them frictionally to engage the walls of the holes so that the retainer does not move inward or outward unintentionally. One or both legs of the retainer or portions thereof engage in notches formed in the proximal part of the tooth only when the retainer is in its inward position. The legs are offset so that when the retainer is depressed an upper offset portion engages in the notches in the tooth and prevents the withdrawal of the tooth. When the retainer is partially withdrawn from the holder, the lower offset portions of the retainer legs do not fit in the notches in the tooth, and hence the tooth may be withdrawn. Means is provided to prevent complete unintentional withdrawal of the retainer from the holder.

3,751,835
IDENTIFICATION SYSTEM

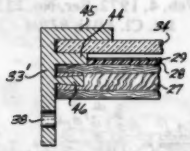
Ward C. Smith, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Dec. 20, 1971, Ser. No. 209,875
Int. Cl. G09f 3/14
U.S. Cl. 40—21 C 7 Claims



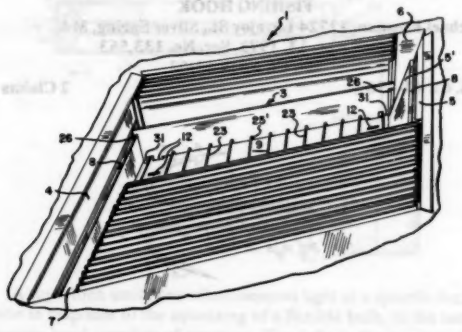
In an identification assembly of the type having an elongated flexible band with fastening means for locking to the limb of a patient wherein the improvement comprises the addition thereto of an identification label dispenser holding a plurality of patient identification labels, with the dispenser including means for holding the labels so that no label can be added without resultant indication thereof. All but one of the labels are removably held and removal thereof requires a pulling force which results in tearing of the label (in the vicinity of the holding means), with the securing of the pulling force insuring that no tampering has occurred. A method of correlating the identity between the patient and specimens taken therefrom sets forth the dispenser-attaching, specimen-drawing, label-removing and label-attaching steps required in carrying out this method.

3,751,836
INDICIA DISPLAY
William B. Frost, 1717 99th N.E., Bellevue, Wash., and Edward N. K. Cooper, 7673 6th St., Burnaby, British Columbia, Canada
Filed Oct. 30, 1970, Ser. No. 85,518
Int. Cl. G09f 1/10
U.S. Cl. 40—64 5 Claims



Indicia bearing strips are mounted in a groove so that their outer surfaces will lie in flush relationship to a backing in which the groove is formed or to adjacent indicia bearing strips between which grooves are formed. Such strips may be replaceable and held in place by fitting undercut grooves and/or by retaining detents or by magnetic attraction. Individual strips may be mounted in grooves in office doors, for example, or may be assembled in edge-to-edge relationship with other strips to form a directory.

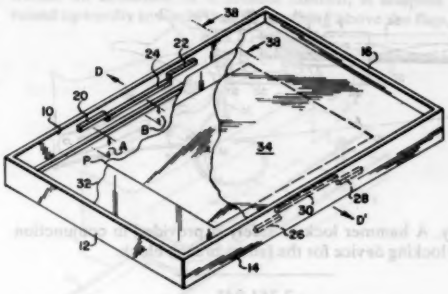
3,751,837
FILING SYSTEM
Romeo T. Proulx, Copiague, N.Y., assignor to Barry Wright Corporation, Watertown, Mass.
Filed Mar. 4, 1971, Ser. No. 121,106
Int. Cl. B42f 7/00
U.S. Cl. 40—78.13 10 Claims



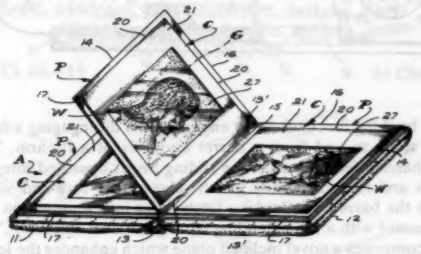
A card registry system comprising a container having a rhomboid outer shape and upwardly diverging side walls, a plurality of dividers pivotally arranged within the container for pivoting at an angle to the side walls, and support means extending across the container between the side walls for supporting the dividers. The dividers have end rails at the opposite ends with offset sections on opposite sides of the divider aligned with the offset sections of the next adjacent divider.

3,751,838
PICTURE FRAME
Samuel Wiener, Jr., 451 W. Broadway, New York, N.Y.
Filed July 15, 1971, Ser. No. 162,860
Int. Cl. G09f 1/12
U.S. Cl. 40—156 12 Claims

An assembly for displaying pictures, photos, posters and the like which can accommodate flat objects of different thicknesses, the assembly includes a frame structure, a plurality of snap ridges or detents fixed to the inner edge surface thereof, a front glass and a backing member adapted to cooperate with said detents to hold the object between the glass and the back member.



3,751,839
DISPLAY DEVICE
Ray M. Mitchell, 6437 Sunset Blvd., Hollywood, Calif.
Filed Dec. 27, 1971, Ser. No. 212,286
Int. Cl. G09f 1/10
U.S. Cl. 40—158 R 19 Claims

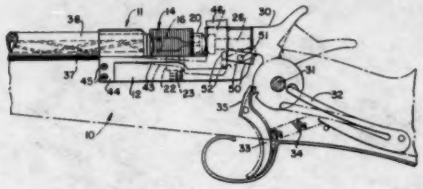


A picture album structure having a plurality of pages, a pair of flat, square, picture carriers with rectangular picture viewing windows related to each page, an orienting and holding means to selectively orient and releasably hold the carriers on the pages with the major axes of the carrier windows on central horizontal or vertical axes of the pages. The orienting and holding means comprising elements on the pages with four like portions on right angularly related axes relative to and spaced equal distances radially of the central axes of the pages and elements of similar configuration and arrangement on the carriers, the elements on the pages or on the carriers being magnetic elements and the other of said elements being ferrous whereby the magnetic and ferrous elements align and hold the carriers on the pages when the carriers are arranged adjacent thereto.

3,751,840
CAP AND BALL RIFLE
Richard J. Casull, 3270 Del Mar Dr., Salt Lake City, Utah
Filed Feb. 25, 1972, Ser. No. 229,371
Int. Cl. F41c 1/00
U.S. Cl. 42—9 10 Claims

A single shot cap and ball gun features a rotary or faucet breech block having a chamber for black powder and a ball. Loading is accomplished with the breech block turned so that the axis of the chamber is across the axis of the gun barrel. Ignition is obtained from a single toy gun cap which fires

through a flash hole in the breech block. The gun barrel contains a forcing cone to shape the ball projectile and increase its



density. A hammer lock or safety is provided in conjunction with a locking device for the faucet breech block.

3,751,841

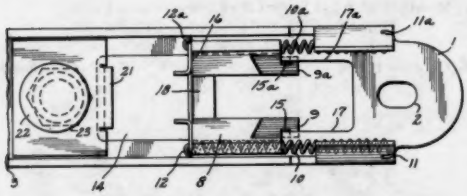
FORESTOCK LATCHING MECHANISM FOR FIREARMS

Paul Nasypany, Herkimer, N.Y., assignor to Remington Arms Company, Inc., Bridgeport, Conn.

Filed Aug. 24, 1971, Ser. No. 174,421

Int. Cl. F41c *23/00*

U.S. Cl. 42—75 A **8 Claims**



A latching mechanism for engaging and disengaging a fore-end stock to and from a barrel assembly of a firearm. The mechanism features a unique sliding finger-operated integral latch and lever assembly which releases the fore-end stock from the barrel. The locking latch slides into snap-action engagement with a rail extending from the barrel assembly. The rail comprises a novel inclined plane which enhances the lock-up of the latch. This latching arrangement provides continuous fit even after extensive firing of the gun. The slidable latch provides for quick take-down. A unique adjustment plate, featuring an eccentric lock nut, is provided to insure proper fit to the barrel assembly.

3,751,842

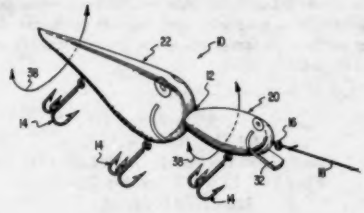
FISHING LURE

Donald K. Smith, 727 W. Outer Dr., Oak Ridge, Tenn.

Filed July 7, 1971, Ser. No. 160,373

Int. Cl. A01k *85/00*

U.S. Cl. 43—42.11 **6 Claims**



There is disclosed a fishing lure having means for oscillating the lure about the longitudinal axis thereof when the lure is pulled through the water. The means for oscillating the lure comprises angularly offset reaction surfaces on different sections of the lure. The lure also comprises means for oscillating the lure transversely of the longitudinal axis thereof when the lure is pulled through the water. The oscillating means operate simultaneously to produce a realistic swimming motion. The two, vertically canted sections of the lure simulate a small minnow in the grasp of a larger minnow.

3,751,843

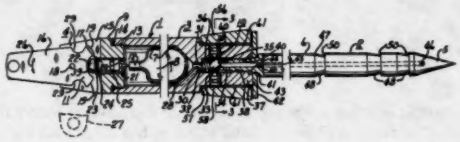
UNDERWATER WEAPON

Thomas Shelnick, Pittsburgh, Pa., assignor to The Shelnick Corporation, Pittsburgh, Pa.

Filed Feb. 4, 1972, Ser. No. 223,458

Int. Cl. A01k *81/04*

U.S. Cl. 43—6 **16 Claims**



An underwater weapon principally for hand use for insertion into a fish after which upon operation of multidirectional release means in the form of a valve, fluid in the form of a liquid or gas is expelled into the interior of the fish causing the fish to become bloated and incapacitated for underwater mobility. The underwater weapon is provided with a hermetically sealed chamber to receive a removable flask containing fluid under pressure. A stiletto is provided on the forward end of the body and is provided with passage means in communication with the chamber so that upon puncture of the flask, the release of the fluid through the passage means in the stiletto may be controlled by the hand operated release means.

3,751,844

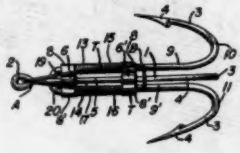
FISHING HOOK

Michael Rossnan, 11724 Lovejoy St., Silver Spring, Md.

Filed Apr. 13, 1971, Ser. No. 133,563

Int. Cl. A01k *83/02*

U.S. Cl. 43—36 **2 Claims**



A fish hook comprising a main hook and at least one oscillatable hook mounted in journals secured to the main hook for rotative movement relative to the main hook. A tensioned coil spring is secured to the shank of the oscillatable hook to bias it away from the main hook. A trigger member secured to the main hook has a looped end engaging the hook bight portions and is released therefrom by the bite of a fish to cause the oscillatable hook to spring outwardly.

3,751,845

FISHING BUCKET

Marion van Leeuwen, 531 High St., Apt. 5, New London, Wis.

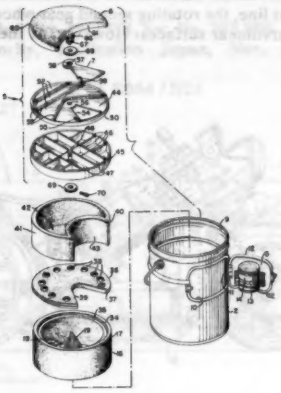
Filed Apr. 23, 1971, Ser. No. 136,718

Int. Cl. A01k *97/04, 97/06*

U.S. Cl. 43—56 **24 Claims**

A compact and easily transportable fishing bucket or the like with a combined closure and rotatable seat means thereon centrally mounted, and means for containing and making readily accessible, food and beverages or the like, live and ar-

tificial baits, tackle, and auxiliary devices. The fishing bucket includes rotatably mounted closure means providing access to its contents while the person is seated on the seat means. Anti-

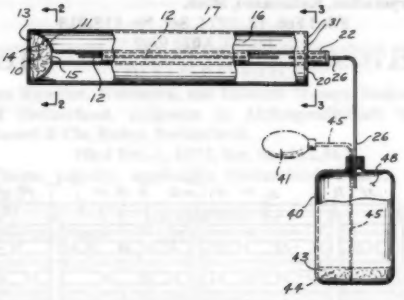


friction means are operatively associated with the seat and engage between the seat and the closure to enable the seat to be readily rotated relative to the closure and the bucket.

3,751,846
CHEMILUMINESCENT TOY

Louis E. Benjamin, Sr., Livingston, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed May 8, 1972, Ser. No. 251,350
Int. Cl. A63h *33/00*
U.S. Cl. 46—1 R **7 Claims**



A toy which emits chemiluminescent light at a specific location in response to the squeezing of a flexible bulb, or the temporary local creation of pressure. The light in the toy may be produced behind the eyes of a toy animal, or at any decorative spot on the toy. The light produced may be used for signal purposes or for the purpose of simulating rays or beams of radiation.

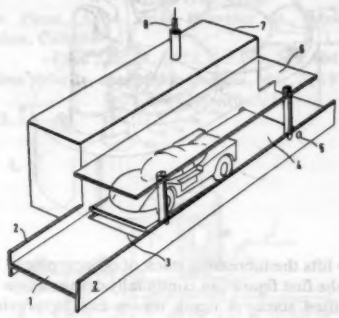
The chemiluminescent light is produced by combining a gas formed in a squeeze bottle with a wick or pad which is soaked in a fluorescent chemical.

3,751,847
COMPONENTS FOR TOY VEHICLE TRACKS

Herman Neuhierl, Waldstr. 36, 8510 Furth/Bayern, Germany

Filed Feb. 16, 1971, Ser. No. 115,430
Claims priority, application Germany, July 7, 1970, P 20 33 598.5; Oct. 21, 1970, P 20 51 625.0; Dec. 22, 1970, P 20 63 300.5
Int. Cl. A63h *33/00*
U.S. Cl. 46—1 K **21 Claims**

A braking device component for a toy racing track comprises a track section having a structural element adapted to be pivoted into the "path of travel" of a vehicle in the section. A flat covering is on the track section and the structural element may be a flap which in a recess formed in the track and which, on actuation of a manual control, is adapted to be raised upwardly towards the flat covering above the flap, or al-

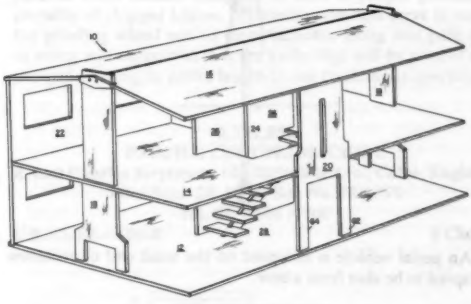


ternatively the covering is pivotally mounted and is adapted to be lowered obliquely downwardly towards a solid track surface which is not formed with a recess. A brake control mechanism is accommodated in a housing attached to the side of the track selection.

3,751,848
MODEL HOUSE

Richard G. Ahlstrand, 1281 Hearst Ave., Berkeley, Calif.

Filed Mar. 13, 1972, Ser. No. 233,904
Int. Cl. A63h *33/06*
U.S. Cl. 46—19 **14 Claims**



A model house that can be erected from a combination of parts without tools or fasteners and then easily knocked down for shipment or storage. A base member has a main cutout to receive a central vertical partition and peripheral openings to receive vertical side members that support a second floor and a folding roof. All parts are rigid members that interlock so that they cooperate together to maintain the structural arrangement of the house.

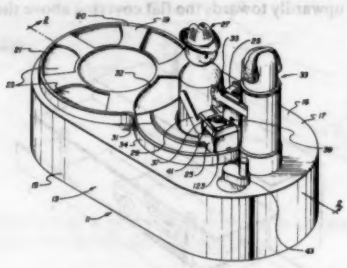
3,751,849
STACKING TOY

Adolph E. Goldfarb, 4614 Monarca Dr., Tarzana, Calif., and Manuel Fernandez, Canoga Park, Calif., assignors to said Goldfarb, by said Fernandez

Filed Feb. 25, 1971, Ser. No. 118,778
Int. Cl. A63h *33/30*
U.S. Cl. 46—40 **8 Claims**

A toy comprising a rotating turntable having a plurality of individual objects thereon. A first figure disposed adjacent the turntable and a second figure disposed adjacent the first figure

such that the first figure rotates from the turntable to the second figure, removing one object at a time from the turntable and delivering it to the second figure. The second figure



successively lifts the increasing stack of objects placed before it such that the first figure can continually deliver a new object under the lifted stack. A crank means can be provided to manually operate the toy.

3,751,850
AERIAL TOY

Peter F. Boulanger, Kincaid, Ill., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed June 20, 1972, Ser. No. 264,414
Int. Cl. A63h *33/20*
U.S. Cl. 46—86 **4 Claims**

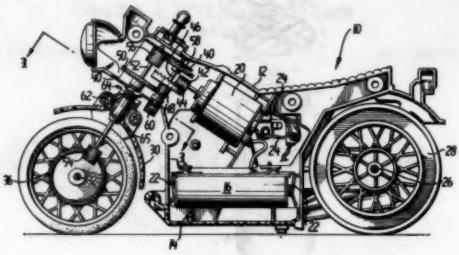
An aerial vehicle is mounted on the head end of an arrow adapted to be shot from a bow.

3,751,851
TOY VEHICLE

Yoshitoshi Nagai, Tokyo, Japan, assignor to Tomy Kogyo Co., Ltd., Tokyo, Japan

Filed Sept. 15, 1972, Ser. No. 289,250
Claims priority, application Japan, Mar. 16, 1972, 47/32152 (utility Model)
Int. Cl. A63h *17/00*
U.S. Cl. 46—206 **3 Claims**

A toy vehicle provided with a front driving and steering wheel is provided with a system permitting the front wheel to automatically change direction when hitting an obstacle so as to permit the vehicle to pass around the obstacle and continue its movement. The vehicle includes a body provided with a source of energy and a motor. The front wheel frame is mounted to freely rotate with respect to the body and a wheel is mounted for rotation about the axle of the frame. The motor turns a drive shaft which is positioned along an axis intersecting the surface along which the vehicle moves at an angle less than 90°. The drive shaft terminates in a pinion wheel which meshes with a rack of continuous teeth formed as a part of the front wheel rotating same so as to propel the vehicle along the surface. Simultaneously, the motor rotates a second resilient pinion wheel positioned adjacent the top of the front wheel frame, which frame is provided with a raised portion including opposed curvilinear surfaces. As the vehicle normally travels in a straight line, the rotating second gear wheel does not contact the curvilinear surfaces. However, as the vehicle strikes

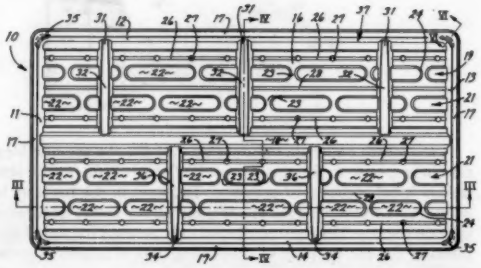


an object in its path, the front wheel frame is caused to rotate in turn causing one of the curvilinear surfaces of the raised portion to engage the rotating second pinion wheel at which time the front wheel is abruptly rotated causing the vehicle to immediately travel in a different direction to avoid further contact with the obstacle to the amusement of the child.

3,751,852
PLASTIC PLANTER FLAT

Gerald A. Schrepper, Kalamazoo, Mich., assignor to Fabri-Kal Corporation, Kalamazoo, Mich.

Filed Feb. 12, 1971, Ser. No. 115,013
Int. Cl. A01g *9/02*
U.S. Cl. 47—34.13 **11 Claims**



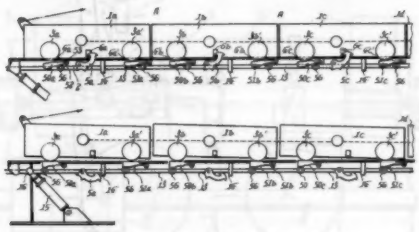
A compartmented tray thermoformed from a sheet of thermoplastic material and having at least two rows of compartments, adjacent compartments in each row being separated by cross ribs. A reinforcing rib extends continuously from one end of the tray to the opposite end thereof joining the pair of adjacent rows. Each of the cross ribs and the reinforcing rib have a substantially inverted U-shaped cross section and the height of the reinforcing rib is greater than the height of the cross ribs to provide a reinforcing structure transverse to each of the cross ribs to strengthen the tray against bending. The cross ribs in one row of compartments are offset with respect to the cross ribs of an adjacent row of compartments but in each row all of said cross ribs are modularly spaced.

3,751,853

METHOD AND APPARATUS FOR OPENING AND CLOSING HATCH COVERS

Yuko Ito, 5-18-1 chome Hayamiya-cho, Nerima-ku, Tokyo, Japan

Filed Nov. 29, 1971, Ser. No. 202,880
Claims priority, application Japan, Nov. 30, 1970, 45/105055
Int. Cl. E05d 15/26
U.S. Cl. 49—127 6 Claims



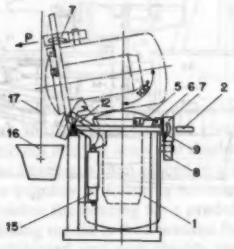
A hatch cover including a plurality of cover panels each of which is aligned with the next panel in closed position by means of male and female members respectively provided on one panel and the other so as to seal accurately a gasket between a pair of adjacent panels. Means are provided for bringing each panel into tilted position when it is separated from the adjacent panel after all the panels are lifted up in one block from the hatch coaming so as to permit each panel to be moved between the position above a hatch coaming and the storing position with its gasket maintained at a level lower than that of a disengaged gasket engaging bar mounted on the adjacent panel.

3,751,854

COVER LIFTING-AND SWINGING MECHANISM FOR A TILTABLE FURNACE

Ernst Huwyler, Wettingen, and Heinrich Wenzel, Baden, both of Switzerland, assignors to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed Feb. 1, 1972, Ser. No. 222,562
Claims priority, application Switzerland, Feb. 5, 1971, 1698/71
Int. Cl. F27b 7/12
U.S. Cl. 49—260 2 Claims



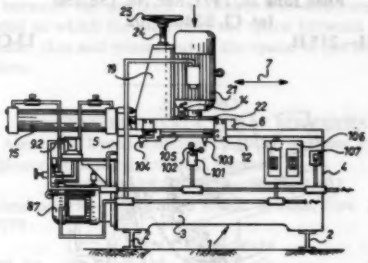
A cover lifting- and swinging mechanism for a tiltable crucible smelting or oven-type furnace wherein the cover is first caused to lift and then swing to an open position for completely emptying the furnace pot after the furnace charge has been drawn off in the usual manner through a pouring spout. The combined lifting and swinging motions imparted to the cover are effected and controlled by means of a hydraulic cylinder secured at the side of the tiltable furnace structure. The piston component of the cylinder is connected to a cylindrical housing having a swing arm that is secured to the cover and the housing is provided with a cam groove associated with a stationary guide roll so as to exercise positive control over the cover and piston movement.

3,751,855

KNIFE GRINDER

Gaston Pinat, 5384 Jules Fournier St., Montreal-North, Quebec, Canada

Filed Jan. 24, 1972, Ser. No. 220,104
Claims priority, application Canada, Mar. 3, 1971, 106,830
Int. Cl. B24b 3/36, 3/38
U.S. Cl. 51—5 9 Claims



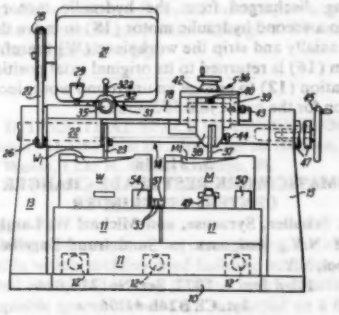
A grinder for automatically grinding knives used mainly in the production of wood chip. These chipper knives consist of a steel plate having a lateral marginal portion inclined relative to the main portion. The plates have a bevelled knife edge along said inclined as well as said main portion. The grinder includes a power-operated grinding wheel mounted for reciprocating movement along a straight path. A swinging support is mounted underneath the grinding wheel and carries adjustable knife holders designed to hold in proper position a plurality of chipper knives. Hydraulic cylinders serve to move the grinding wheel and its electric motor along said path and to swing said support so that the knife edge will be ground and sharpened along its entire length in one continuous operation.

3,751,856

PROFILE COPYING MACHINE

Ernest Charles Jorgensen, 148 Birtwistle Ave., Colne, England

Filed Sept. 28, 1971, Ser. No. 184,591
Int. Cl. B24b 17/00
U.S. Cl. 51—100 R 6 Claims



A profile copying machine has a workpiece shaping tool and stylus, for following the profile of a model, mounted on a pivoted platform so that the tool and stylus have the same radius of movement. The stylus is in the form of a wheel with a radiused peripheral edge and the tool, which is in the form of a grinding wheel, has a similar edge so that the equivalent of point contact with the workpiece and model is obtained. The

stylus may be adjusted towards and away from the model. The workpiece and model are mounted on a reciprocating table and the tool and stylus can progressively traverse across the reciprocating workpiece and model. The tool can be driven by an electric motor which acts as a balancing weight for the pivoted platform so that the platform has two stable positions: one position with the tool and workpiece in contact and the other position with the tool raised clear of the workpiece.

3,751,857

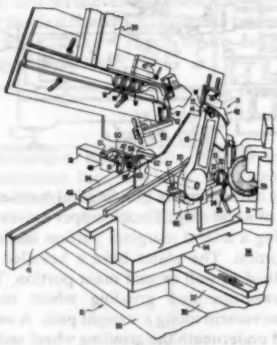
LOADER MECHANISM FOR A MACHINE TOOL

Ralph E. Price, and Dudley V. Bickford, both of Waynesboro, Pa., assignors to Landis Tool Company, Waynesboro, Pa.

Filed June 24, 1971, Ser. No. 156,250

Int. Cl. B24b *47/02*

U.S. Cl. 51—215 H **13 Claims**



An automatic loader (11) for a machine tool, such as a concentric grinding machine (10), wherein the arcuate movement of a loader arm (16) carries ring-like workpieces (W) from a loading station (12) to a grinding station (13). The loader arm (16) is axially displaced to strip the ground workpiece (W) from a loader stud (21) at a precise angular position to discharge a workpiece at an unloading station (14), while the loader arm (16) is being raised from the grinding station (13) to the loading station (12) to engage the next workpiece (W). The axial movement occurs when the fluid being discharged from a first hydraulic motor (24), which effects the raising of the loader arm (16), advances a piston (22) within a displacement cylinder (17) so as to expose a port (26). Thereafter, the fluid being discharged from the hydraulic motor (24) is directed to a second hydraulic motor (18) to move the loader arm (16) axially and strip the workpiece (W) therefrom. The loader arm (16) is returned to its original axial position at the loading station (12) to engage an unground workpiece (W) in preparation for the next cycle of operation.

3,751,858

AUTOMATIC WORK REST BLADE CHANGER FOR CENTERLESS GRINDER

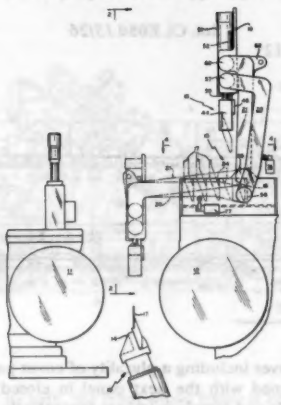
Robert L. Schaller, Syracuse, and Michael W. Lamb, Minoa, both of N.Y., assignors to Sundetrand-Engelberg, Inc., Liverpool, N.Y.

Filed Jan. 7, 1972, Ser. No. 216,016

Int. Cl. B24b *41/06*

U.S. Cl. 51—238 GG **7 Claims**

An automatic blade changer for the work rest structure of a centerless grinder. The different sized blades are stored in a rack that moves on signal to present the blade that is called for to a pick up mechanism on a swingable blade carrier. The pick up mechanism withdraws the blade from the rack after which the carrier moves through an arc to position the blade above the work rest structure. The pick up mechanism then deposits the blade in the work rest structure, the latter having releasable clamping means to secure the blade therein. To return the



blade to the storage rack the sequence of operations is reversed.

3,751,859

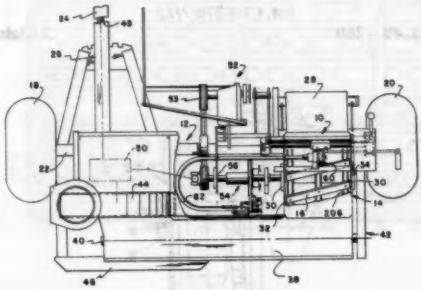
FORAGE HARVESTER KNIFE SHARPENER WITH A ROTARY ABRASIVE WHEEL

Poul K. Pedersen, Blue Ball; Robert A. Wagstaff, and Thomas W. Waldrop, both of New Holland, all of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Sept. 24, 1971, Ser. No. 183,391

Int. Cl. B24b *19/00*

U.S. Cl. 51—249 **13 Claims**



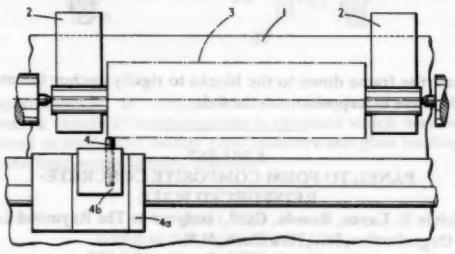
A forage harvester knife sharpener having two shafts parallel to the cutterhead for slideably supporting a carrier with an abrasive wheel rotatably mounted therein and driven from the forage harvester drive. One shaft being fixed, and the carrier being pivotally and laterally slideable thereon while the other shaft, being on the other side of the abrasive wheel from the fixed shaft, being adjustably mounted in a rigid frame for moving the abrasive wheel to and from the cutter-head to grind cutting bevels and relief bevels on the knives.

3,751,860

METHOD OF GRINDING ROLLS

John Noel Tittle, Knutsford, England, assignor to The Churchill Machine Tool Company Limited, Broadheath, Altrincham, Cheshire, England

Division of Ser. No. 10,136, Feb. 10, 1970, Pat. No. 3,651,605.
This application Oct. 6, 1971, Ser. No. 187,028
Claims priority, application Great Britain, Feb. 11, 1969, 7,276/69
Int. Cl. B24b 1/00, 5/04
U.S. Cl. 51—289 R 1 Claim



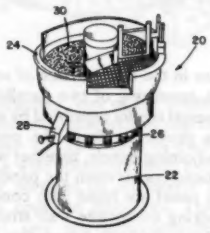
A method in which the diameters of two rolls are matched by grinding one roll, measuring the position of the surface of the ground roll relative to a datum position using a probe, and grinding the second roll until the surface thereof is in the same position relative to the datum position as was the surface of the first roll.

3,751,861

METHOD FOR FINISHING ANTI-FRICTION BEARINGS

Charles C. Frost, Kentwood; Thomas E. Shaw, Grandville, and Siegfried K. Weiss, Grand Rapids, all of Mich., assignors to Forst Engineered Products, Inc., Grand Rapids, Mich.

Filed June 30, 1971, Ser. No. 158,311
Int. Cl. B24b 1/00, 11/02, 31/06
U.S. Cl. 51—316 10 Claims



A method for refurbishing used assembled anti-friction bearings in which the bearings are first given a preliminary washing with a solvent and the seals and shields on the bearing are removed. The bearing is then placed in a vibratory finishing mill having a quantity of finishing material therein which acts upon and finishes the bearing for a predetermined period of time. The finishing media is then washed from the bearing, the bearing is lubricated and new shields are replaced. The final finishing of new bearings may also be accomplished in accordance with the method disclosed herein.

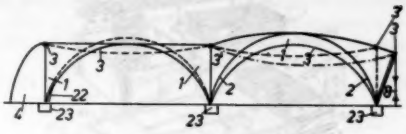
3,751,862

PNEUMATICALLY SUPPORTED STRUCTURE

Josef Linecker, A 5230 Mattighofen, Austria

Filed Apr. 2, 1971, Ser. No. 130,758
Int. Cl. E04b 1/34
U.S. Cl. 52—2 17 Claims

A pneumatically supported structure of polyhedral configuration has a plurality of diagonal anchors running between foundation members at the corners of the structure and lying along diagonals thereof. In addition, rigid arches span the foundation members along at least some of the sides and act as supporting members for the flexible skin which is used in sec-



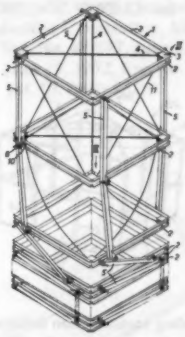
tions between the anchors. A double-wall structure may be provided in which the air enters the space between the inner and outer skin and passes out of the space at the base of the structure.

3,751,863

EXTENSIBLE STRUCTURAL MEMBERS

John Alexander Lyons, London, England, assignor to Creative Engineering Limited, London, England

Filed Nov. 19, 1971, Ser. No. 200,471
Claims priority, application Great Britain, Nov. 20, 1970, 55427/70
Int. Cl. E04h 12/34
U.S. Cl. 52—111 11 Claims



A self-erecting tower structure, for example, for overhead inspection and for supporting lights, aerials, antennas, and cameras. The structure includes an extensible member comprising a number of superimposed frames and self-erecting legs interconnecting the frames and erecting means, such as endless chains or a screw-threaded column, arranged to raise each of the frames in succession through a distance at least equal to the length of the legs.

3,751,864

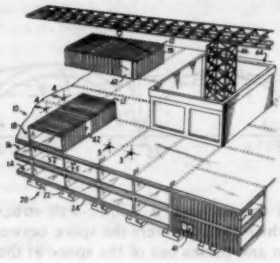
INTERSTITIAL SPACE FRAME SYSTEM

Horst Berger, 18 Chestnut Dr., Hastings on Hudson, N.Y., and Harry Weese, 1235 N. Aston, Chicago, Ill.

Filed Apr. 11, 1972, Ser. No. 242,950
Int. Cl. E04h 1/02
U.S. Cl. 52—79 31 Claims

A building and a method for constructing the building are disclosed in which prefabricated building modules, formed of corrugated metal and having finished interior surfaces defining occupiable spaces therein, are supported on a foundation in a plurality of layers, each of which provides one story of the building. The modules are placed in spaced relation to each other in the layers in order to provide open through passages between adjacent module side walls, with the corrugations on adjacent side walls being spaced from each other. The corrugations on adjacent side walls cooperate with spacers or forms placed therebetween to define forms in which concrete, in a flowable condition, is poured to form the vertical structural

members or columns of the building. In one embodiment a concrete slab is poured over the ceiling panels of each of the



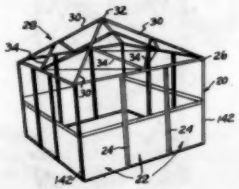
modules in a layer to form an integral horizontal structural member between the vertical structural members and to provide support for the next layer of modules in the building.

3,751,865

MODULAR BUILDING CONSTRUCTION

George B. Brigham, 517 Oxford Rd., Ann Arbor, Mich.

Filed Feb. 3, 1971, Ser. No. 112,251
Int. Cl. E04b *7/04, 2/62*
U.S. Cl. 52—92 7 Claims



A modular building construction fabricated of a plurality of individual panel section modules selectively interconnected to each other by means of slide-in connecting members and the roof construction is made up of a plurality of roof ribs interconnected together at a common apex and which can be folded together in umbrella fashion and which when assembled to the panel building is adapted to support a canvass or similar roof covering. The individual panel section modules consist of frames of extruded metal such as aluminum, which by means of snap-in moldings support panels such as decorative plywood panels or plastic panels, window glass, screen or the like in selectively interchangeable fashion; the circumferential edges of the frames of the panel members are channeled and the individual panels are connected by connecting members of plastic or the like which are slid in place longitudinally to fit over protruding flanges provided in the opposite channels, or adjoining panel members.

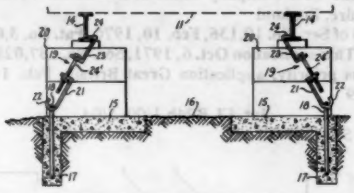
3,751,866

MOBILE HOME ANCHOR

Frank Renchen, R.R. 1, Manteno, Ill.

Filed Mar. 3, 1972, Ser. No. 231,538
Int. Cl. E02d *5/80*; E04b *12/20*
U.S. Cl. 52—149 1 Claim

A mobile home anchor which includes a concrete slab poured in the surface of the ground and having a foundation extending downwardly therefrom. The slab has a metallic eye anchored therein and extending above the top surface thereof. The mobile home is positioned on the concrete slab and a plurality of extensible and contractible brackets are hooked to the frame of the mobile home and to the eyes extending upwardly from the concrete. The frame is blocked up by fixed blocks resting on the slab and the brackets are tightened to



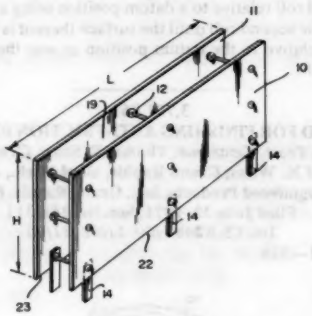
draw the frame down to the blocks to rigidly anchor the mobile home in its position on the slab.

3,751,867

PANEL TO FORM COMPOSITE CONCRETE-REINFORCED WALL

Melvin E. Layne, Reseda, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Dec. 3, 1971, Ser. No. 204,425
Int. Cl. E04b *2/26*
U.S. Cl. 52—426 3 Claims



A panel for use in the construction of composite concrete-reinforced walls, consisting of two parallel sheets of pressed composition material rigidly separated by metal rod members, with metal tabs projecting from the panel sheets to bear against similar adjoining panels, together with additional steel reinforcement members between the panel sheets. The interior spaces of the panel are filled with concrete which sets to form an interlocking composite wall structure of metal rod members, additional steel reinforcements, the external panel sheet and the concrete.

3,751,868

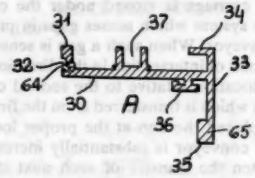
STRUCTURE FOR THE ASSEMBLY OF FIXTURES FOR DOORS, WINDOWS AND THE LIKE

Ascanio Mascioletti, Via S. Nicola di Santanza 263, L'Aquila, Italy

Filed July 27, 1970, Ser. No. 58,428
Int. Cl. E04c *3/04*; E06b *1/14*
U.S. Cl. 52—731 1 Claim

An improved metal structure for fixtures for doors, windows and the like, comprises a basic unit which consists of a rectilinear section having 1) at one end an extension in the perpendicular direction provided with a seat, preferably of trapezoidal configuration, which has a lateral hole adapted to receive a packing, 2) at the other end a cross-member the ends of which are constituted of a short section folded inwardly and provided with a block designed to provide the support for the glass, 3) a short angulate tooth and 4) on the opposite side of the tooth a U-shaped seat designed to serve as

support for other structural elements. This unit may be associated with a C-shaped section provided with a clamp, forming an element, adapted to serve as support for the glass or two units may be associated, forming a T-shaped element, or a Z-



shaped element. In combination with complementary elements, a variety of configurations is obtained which may be utilized as single and double glass fasteners and glass holding means, basement windows, shutters.

3,751,869

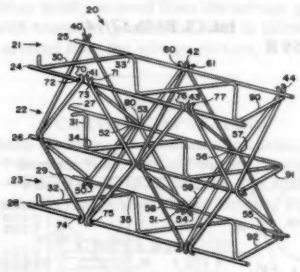
WIRE SUPPORT STRUCTURE

Johnnie F. McDonald, 1113 W. Mesa Rd., and Frederick J. Sparber, R.D. 1, Box 192A, both of Belen, N. Mex.

Filed Oct. 4, 1971, Ser. No. 186,335

Int. Cl. E04b *12/10;* **E04c** *5/06*

U.S. Cl. 52—650 **12 Claims**



A wire support structure, one of the continuous repeating patterns of which includes, spot welded together, three parallel sets of two wires, the two wires in each such set being interconnected by a wire configured into a continuous series of V shapes, the V patterns on successive sets being alternately disposed in opposite directions. Opposite wires of successive parallel sets are interconnected at the open ends of the V shapes by wires also configured into a continuous series of V shapes. Finally, another set of V configured wires are fastened onto the faces of the structure adjacent the points at which the wire interconnecting opposite wires of adjacent sets of two wires are attached.

3,751,870

FRAME STRUCTURE SYSTEM

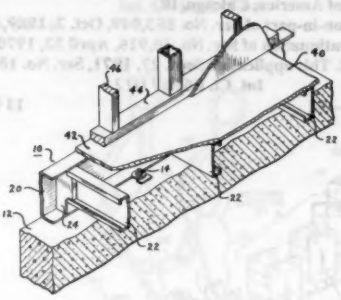
Laszlo M. Vesei, Niles, Mich., assignor to Elkhart Wlding & Boiler Works, Inc., Elkhart, Ind.

Filed Feb. 5, 1971, Ser. No. 112,944

Int. Cl. E04c *2/42;* **E04b** *1/34*

U.S. Cl. 52—656 **3 Claims**

A frame structure system having a plurality of spaced parallel perimeter beams of U-channel configuration and including cross members extending into the perimeter beams between the upper and lower flanges and being rigidly secured to the beams to form a rigid structure. The cross members may be of a C-channel configuration and may be of substantially the same height as the perimeter beams, or be of a lesser height, and secured to said beams with the upper surface thereof on substantially the same plane as the upper surface of the beams.



Fixtures are secured to said ends of said cross members and are preferably secured to the beams by riveting.

3,751,871

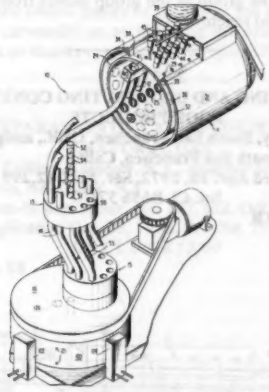
COIN PROCESSING METHOD

Gerry G. Hull, and Eugene B. Morris, Jr., both of Atlanta, Ga., assignors to ATL Machine Corporation, Atlanta, Ga.

Continuation of Ser. No. 48,077, June 22, 1970. This application June 15, 1972, Ser. No. 263,312

Int. Cl. B65b *35/50*

U.S. Cl. 53—26 **4 Claims**



A coin processing method and apparatus in which coins of predetermined physical characteristics are lifted from a mass of coins, dropped into a plurality of coin hoppers and moved through individual conduits down to a coin shelf. A predetermined number of coins from the hoppers are allowed to accumulate and form stacks on the coin shelf and the stacks of coins are passed in sequence over a discharge opening in the coin shelf. Balls of a diameter approximately equal to the diameter of the coins are inserted between the coin stacks at the coin shelf discharge opening, and a transparent plastic material is applied to the line of coin stacks and balls to form a continuous tubular wrapper about the coins and balls. The continuous wrapper is opened at the balls and the balls are separated from the coin stacks, leaving separate packages of coins.

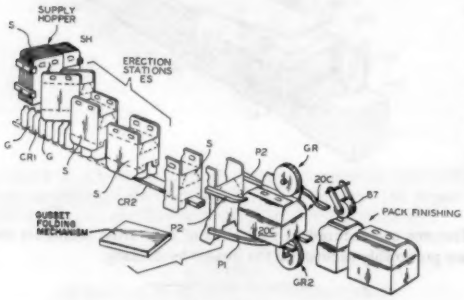
3,751,872
APPARATUS AND METHOD FOR ENCLOSING OF CONTAINER GROUPS

Charles Robert Helms, Barto, Pa., assignor to Container Corporation of America, Chicago, Ill.

Continuation-in-part of Ser. No. 863,049, Oct. 2, 1969, which is a continuation of Ser. No. 30,916, April 22, 1970, abandoned. This application Sept. 27, 1971, Ser. No. 184,265

Int. Cl. B65b *11/12*

U.S. Cl. 53—32 **11 Claims**



Apparatus and method for enclosing a discrete group of articles, such as cans or bottles arranged in a double row carton sleeve, the groups moving along a first conveyor reach having a width substantially equal to the width of the double row, and then along a second conveyor reach substantially less in width than the first reach, a tubular carton being adapted to move into position around the group as it moves from the first reach to the second reach. The tubular carton has lower closure elements adapted to embrace the second reach, and structure is provided for moving the closure elements into position against the bottom of the group as the group moves from the second reach to the third reach.

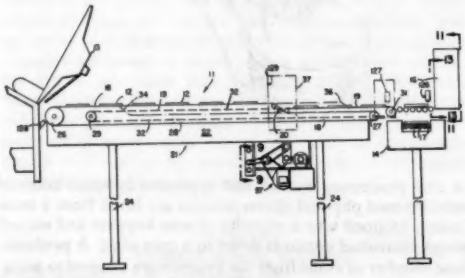
3,751,873
ACCUMULATING AND DISTRIBUTING CONVEYOR FOR FOOD PRODUCTS

Edward P. Toby, South San Francisco, Calif., assignor to Toby Entrprises, South San Francisco, Calif.

Filed Apr. 10, 1972, Ser. No. 242,299

Int. Cl. B65b *57/10*

U.S. Cl. 53—59 R **10 Claims**



An accumulating and distributing mechanism is described for delivering stacks of sliced meat from a meat slicing machine to a packaging machine at a controlled rate irrespective of random fluctuations in the rate at which the stacks are furnished from the slicing machine. The mechanism includes a pair of conveyors which are coextensive with one another over a portion of their lengths and which mesh at a point of intersection for transference of the stacks from one to the other. A first one of the conveyors receives the stacks sequentially from the slicing machine and delivers the same to the second conveyor which, in turn, delivers such stacks to the packaging machine. A carriage establishes the intermeshing intersection of the two conveyors and is movable longitudinally along their coextensive lengths to longitudinally vary the position of such intersection. The carriage is moved under the control of a product detection system which senses gaps in produce flow along the first conveyor. When such a gap is sensed, the carriage moves the point of intersection in the direction of flow of the product to a location relative to the second conveyor so that the next stack which is transferred from the first conveyor to the second is placed thereon at the proper location. The speed of the first conveyor is substantially increased during such time to hasten the transfer of such next stack to the second coneyor. When the next stack is transferred, carriage movement is reversed and if continuous product flow is sustained the carriage continues to move in the reverse direction to a normal home position, and the speed of the first conveyor is restored to normal. In this manner gaps in the supply product flow along the first conveyor do not appear in the demand product flow along the second conveyor.

3,751,874
APPARATUS FOR STORING PHOTOGRAPHIC FILMS AND PRINTS

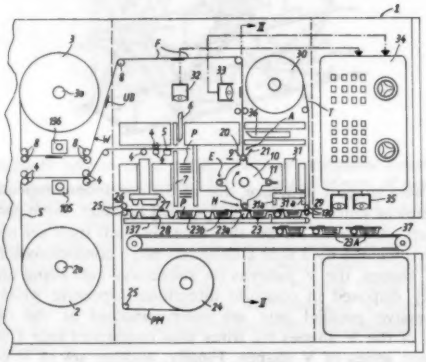
Herbert Schultes, and Norbert Schlagheck, both of Furstenfeldbruck, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 23, 1971, Ser. No. 182,985

Claims priority, application Germany, Sept. 25, 1970, P 20 47 234.8

Int. Cl. B65b *57/14*

U.S. Cl. 53—59 R **19 Claims**

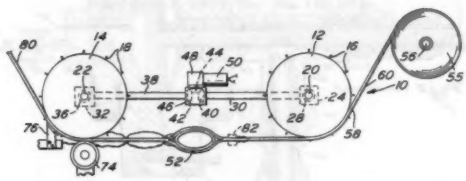


Apparatus for introducing exposed and developed customer films and prints which are reproduced from such films into discrete customer containers employs two transporting devices which advance a web of interconnected films and a strip of prints along separate paths, a first severing device which severs the web to separate therefrom successive films or sections of successive films, a second severing device which subdivides the strip into discrete prints, a container forming device which furnishes containers having first and second compartments to respectively receive films and corresponding prints, a computer which prepares customer invoices on the basis of information furnished by detectors positioned adjacent to the first and second paths and to the path for filled containers and applies shipping labels to filled containers, and a sealing device which covers the open sides of filled containers with foils of transparent synthetic plastic material.

3,751,875
APPARATUS FOR FILLING, SEALING AND DISPENSING BAGS

Hercules Membrino, 1934 Arch St., Philadelphia, Pa.

Filed Sept. 9, 1971, Ser. No. 178,908
Int. Cl. B65b *9/08, 43/12*
U.S. Cl. 53—180 8 Claims

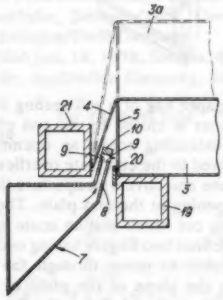


A process and apparatus for filling, sealing and dispensing bags from a strip of interconnected bags which comprises moving the strip of bags from a supply roll along a path to at least one, but, preferably, two sprocket wheels. The strip of bags is provided with spaced sprocket apertures in a selvage portion along the edge corresponding to the open mouths of the bags, and these apertures are engaged by the sprockets on the sprocket wheels to move the strip of bags linearly at predetermined intervals. As the individual bags are brought into conjunction with a feed means, such as a chute or the like, they are filled, and are then moved through sealing and severing stations where the open mouths are sealed and the sealed bags are either totally severed from the selvage portion or are provided with scored or perforated lines to permit them to be thereafter severed from the selvage portion.

3,751,876
CARTON FLAP SEALING

John Richard Oakley, 87 Churchward Ave., and Shaun Kearns, 7 Duchess Way, both of Swindon, England

Filed Feb. 9, 1972, Ser. No. 224,888
Claims priority, application Great Britain, Feb. 12, 1971, 4,579/71
Int. Cl. B65b *7/20*
U.S. Cl. 53—375 10 Claims

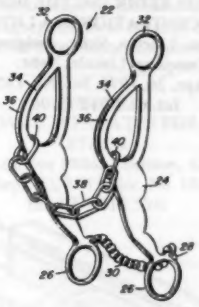


A hollow member arranged to apply heated air to heat-sealable surfaces of a pair of carton flaps folded to form an acute angle comprises an elongate chamber, preferably of generally triangular cross-section, which is connectable through a valve with a source of heated air. A nozzle extends from one corner of the chamber to extend between the pair of flaps and the nozzle has the end thereof remote from the chamber closed by a closure member which forms one side of opposed slots which extend lengthwise of the nozzle to direct heated air on to mating areas of the carton flaps. The closure member causes air to be deflected through the slots at substantially equal flow rates.

3,751,877
BRIDLE CONTROL BIT

Veldon Morgan, Ellsworth, Nebr.

Filed July 21, 1971, Ser. No. 164,699
Int. Cl. B68b *1/04*
U.S. Cl. 54—6 7 Claims

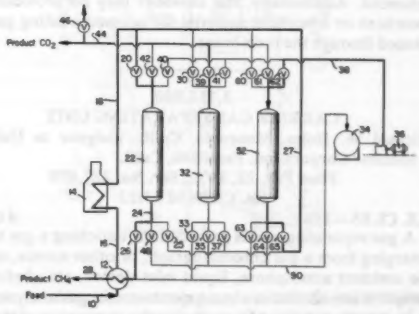


A bridle bit including opposite side elongated plate-like upstanding shanks for disposition at the sides of the mouth of a horse and including rein eyes at their lower ends and support eyes at their upper ends through which adjacent ends of the nose band and lower ends of the cheek straps of the associated bridge are secured. A chain chin strap is secured between the lower eyes of the shanks or cheek pieces and approximately the upper third of each of the shanks disposed below the upper end eyes define vertically elongated eye portions between which a bit or mouthpiece chain is secured, the opposite end links of the bit or mouthpiece chain being slidably disposed on the front portions of the vertically elongated eye portions of the shanks or cheek pieces whereby the elevation of the ends of the bit or mouthpiece chain may be increased along the eye portions of the cheek pieces or shanks as the associated reins are pulled rearwardly so as to swing the lower ends of the cheek pieces or shanks rearwardly and upwardly.

3,751,878
BULK SEPARATION OF CARBON DIOXIDE FROM NATURAL GAS

John Joseph Collins, Katonah, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 187,162, Oct. 6, 1971. This application Oct. 20, 1972, Ser. No. 299,461
Int. Cl. B01d *53/04*
U.S. Cl. 55—58 3 Claims



In the bulk separation of carbon dioxide from feedstocks containing same in admixture with relatively non-sorbable gases using a zeolitic molecular sieve to adsorb selectively the carbon dioxide, higher product purity is attained by terminating the adsorption stroke using the feedstock while the bed

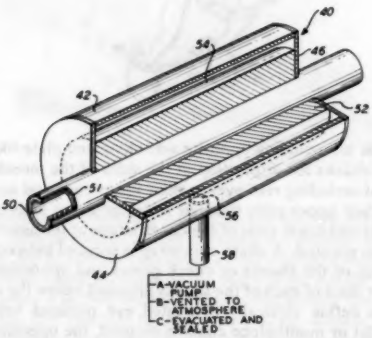
still has capacity to adsorb more carbon dioxide at the same conditions, then purging the void space hydrocarbons from the bed using product carbon dioxide at a high partial pressure, and finally desorbing the bed by pressure reduction.

3,751,879

APPARATUS FOR REDUCING THE DISSOLVED GAS CONCENTRATION IN A LIQUID

Robert W. Allington, Lincoln, Nebr., assignor to Instrumentation Specialties Company, Lincoln, Nebr.

Filed Apr. 26, 1971, Ser. No. 137,381
Int. Cl. B01d *13/00*
U.S. Cl. 55—158 **30 Claims**



Apparatus for reducing the dissolved gas concentration in a liquid, for example, a liquid flowing in chromatographic system, utilizing the ability of the gas dissolved in the liquid to pass through a gas permeable membrane. The liquid is exposed to one surface of the membrane and the opposite surface of the membrane is provided with a coating of gas-soluble substance for increasing the permeability of the membrane and thereby enhancing the permeation of the gas through the membrane. Further, in various embodiments of the invention, a chamber is provided opposite or surrounding the coated membrane and, in accordance with the teachings of the present invention, the chamber may be vented to the atmosphere, evacuated and sealed or communicated to a means for establishing a pressure in the chamber sufficiently lower than the pressure of the liquid exposed to the membrane such that the permeation of the gas through the membrane is enhanced. Additionally, the chamber may be provided with absorbent or adsorbent material for accommodating gas permeated through the membrane.

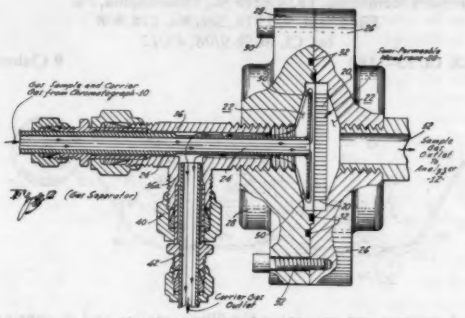
3,751,880

CARRIER GAS SEPARATING UNIT

Michael W. Holm, Monrovia, Calif., assignor to Universal Monitor Corporation, Pasadena, Calif.

Filed Feb. 22, 1972, Ser. No. 227,879
Int. Cl. B01d *53/22*
U.S. Cl. 55—158 **4 Claims**

A gas separating unit is provided for enriching a gas sample emerging from a gas chromatograph, or other source, such as the ambient atmosphere, liquid inlet device, etc., before the sample is introduced to a mass spectrometer gas analyzer. This separation is achieved by removing the carrier gas of the sample from the sample constituents which are to be subjected to mass spectrometric analysis in the analyzer. The separating unit of the invention makes use of a semipermeable membrane which is mounted in a unique housing. The housing is constructed, as will be described, so that the sample and carrier gases are directed across the membrane in a manner so as to make full use of the surface of the membrane, and to assure



that all the gas mixture passing into the separating unit contacts the membrane.

3,751,881

DUST RECEPTACLE FOR A VACUUM CLEANER

George Leslie Hughes, Bedford, England, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed June 8, 1971, Ser. No. 150,993
Claims priority, application Great Britain, June 18, 1970, 29655/70
Int. Cl. B01d *46/02*
U.S. Cl. 55—367 **14 Claims**

An open-ended paper bag of a self-sealing dust receptacle for a vacuum cleaner is closed by an end plate having an elastic membrane extending across an opening therein. An elongated tongue fixed to the end plate overlies a central portion of the membrane and covers an aperture therein which is smaller than the opening in the end plate. The tongue has a diagonally extending cut which is at an acute angle to its longitudinal axis and defines two fingers having overlapping outer pointed ends operable to move through the aperture and swing inward from the plane of the plate by force applied thereto. With cessation of such force the fingers are biased toward the plane of the plate by the elastic membrane and close the aperture in the membrane.

Two portions of the end plate are movable about a fold line between two positions in one of which they are in the same plane and in another of which they are in abutting relation at right angles to such plane. The diagonally extending cut in the tongue is at such fold line. The plate has two spaced apart slots at such fold line to receive lugs at the open end of a paper bag formed by tabs in the pleated end walls when the pleats are compressed and held together. The bag side walls have notched zones at the open end of the bag which extend between the lugs and are fixed to the inner faces of the two

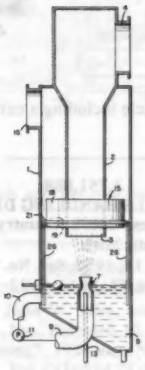
portions of the end plate by adhesive material when such portions are moved into abutting relation with the notched zones therebetween.

3,751,882

GAS SCRUBBER WITH MOISTURE ELIMINATOR

Norman D. Phillips, Bethlehem, Pa., assignor to Fuller Company, Catasauqua, Pa.

Filed June 4, 1971, Ser. No. 150,072
Int. Cl. B01f 3/04
U.S. Cl. 55—236 4 Claims



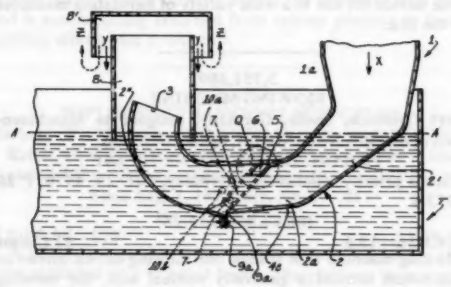
A gas scrubber which is improved by the addition of a moisture eliminator arrangement between the scrubbing zone and the clean gas outlet. The moisture eliminator is particularly designed for use in a countercurrent flow, high energy scrubber in which scrubbing liquid is atomized by means of compressed air and injected into the dirty gas countercurrent to the flow of dirty gas. The moisture eliminator includes a toroidal shaped cylinder having a plurality of spin vanes. The spin vanes and scrubber are dimensioned to maintain gas flow velocities within specified limits.

3,751,883

APPARATUS FOR SCRUBBING OF GASEOUS FLUIDS

Helmut Mergenthaler, Jesingen/Teck, Germany, assignor to Otto Keller, Jesingen/Teck, Germany

Filed Jan. 19, 1970, Ser. No. 4,015
Claims priority, application Germany, Jan. 28, 1969, P 19 03 985.1
Int. Cl. B01f 3/04
U.S. Cl. 55—248 14 Claims



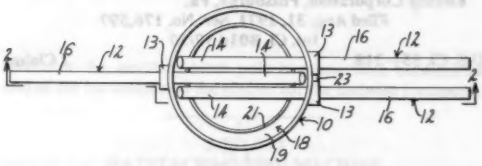
Apparatus for scrubbing of gases wherein the duct through which a gas stream to be treated is conveyed includes a section located below the level of liquid in a tank. The narrowest part of the duct section accommodates at least one transversely extending barrier which produces turbulence in a portion of the interior of the duct located immediately downstream of the barrier, and such portion of the interior of the duct communicates with one or more relatively large openings which admit liquid from the tank into the turbulent gas stream whereby the liquid is atomized and dust or other particles in the gas stream react with or are surrounded by globules of atomized liquid. Such globules are segregated from the thus cleaned gas stream in a cyclone diffuser or other separating device.

3,751,884

STEAM REMOVAL APPARATUS FOR DISCHARGE STACK

Roy C. Hathorn, P.O. Box 1806, Anniston, Ala.

Filed Sept. 23, 1971, Ser. No. 183,088
Int. Cl. B01d 5/00
U.S. Cl. 55—267 4 Claims



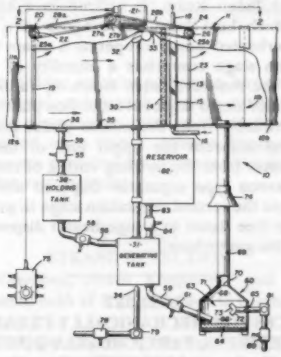
Portions of metal members having high thermal conductivity extend inwardly of a stack with other portions thereof extending outwardly of stack and out of contact with steam and other gaseous products conveyed by the stack reducing temperature of the inwardly extending portions by conduction of heat to other portions. Collector means receives water condensed onto the inwardly extending portions and discharge means removes water from the collector means.

3,751,885

AIR SCRUBBER

Charles D. McNeely, 3060 Killian Rd., Uniontown, Ohio

Filed July 8, 1971, Ser. No. 160,736
Int. Cl. B01d 46/00
U.S. Cl. 55—267 4 Claims



An air scrubber for removing and selectively incinerating the condensable contaminants from the exhaust stream of a ventilating system. A generally localized surface area is provided within a collection chamber such that the exhaust stream can flow turbulently therearound and contaminants can condense thereupon. Cooling means may be provided to maintain a temperature differential between the surface area

and the exhaust stream stream in order to facilitate condensation. Gate means are periodically closed to maintain the collection chamber discrete from the remainder of the ventilating system, and while the gate means are closed a communicating means directs a cleansing medium across the surface area to remove the accumulated contaminants. The mixture of the cleansing medium and the contaminants is collected and separated so that the cleansing medium may be recycled. The contaminants may then either be collected for removal or conducted into an incinerator where they are received for incineration in a first combustion area. The products of the aforesaid combustion preferably pass through a second combustion area which serves as an after-burner to eliminate substantially all unburned hydrocarbons or other pollutants from the flue gas leaving the incinerator.

3,751,886

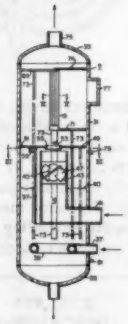
VERTICAL STEAM DRUM

Peter F. Sokolowski, Media, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 31, 1971, Ser. No. 176,597

Int. Cl. B01d *59/50*

U.S. Cl. 55—318 **2 Claims**



A vertical steam drum having two moisture separation stages, which cooperate to remove the majority of the water from moisture laden steam, is utilized in a heat recovery system, in which heat from the exhaust of a gas turbine produces superheated steam to operate a steam turbine. The first separation stage comprises a plurality of swirl vanes, which direct the moisture laden steam upwardly to form a swirling vortex of steam adjacent an orifice plate, a sleeve extending downwardly from the orifice plate, and tangential ducts disposed adjacent the upper end of the sleeve for discharging water from the swirling vortex of moisture laden steam. A chevron type separator disposed above the first separator forms the second separation stage to provide essentially moisture free steam to a superheater disposed in an exhaust duct of the gas turbine.

3,751,887

DEVICES FOR MECHANICALLY CLEARING WATERWAYS, PARTICULARLY DITCHES

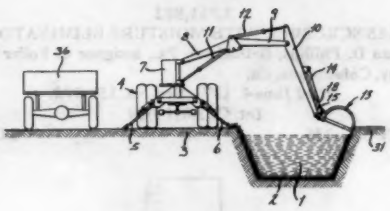
Johannes den Herder, and Pieter Willem den Herder, both of Serooskerke, Netherlands, assignors to Firma Gebroeder den Herder, Serooskerke, Netherlands

Continuation of Ser. No. 821,204, May 2, 1969, abandoned. This application May 19, 1971, Ser. No. 145,056

Int. Cl. A01d *45/18*

U.S. Cl. 56—8 **12 Claims**

In a device for clearing waterways of plant life or other growth, a king post assembly mounts upon a vehicle, with said post being swingable with respect to its mounting, and includes a multi-sectioned boom having a hydraulically controlled mowing receptacle including a cutter bar positioned at its extremity.



3,751,888

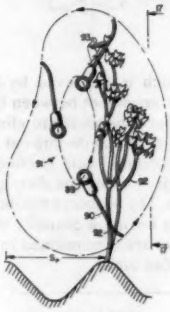
MATERIALS HANDLING DEVICES

William Edward James, 24098 Country Squire Boulevard, Apt. 230, Mt. Clements, Mich.

Filed Dec. 18, 1970, Ser. No. 99,580

Int. Cl. A01d *45/22*

U.S. Cl. 56—130 **3 Claims**



An "oblique reel" materials handling device wherein link bars or tine bars are carried between end members rotating on parallel offset axes and the tine bars orbit in oblique circular paths as in the parallel bar hay rake, but also rotate, each on its own axis, as in the cylindrical reel of the typical pickup of a hay baler, combining advantages of the parallel bar reel with the freedom of tine orientation control of the cylindrical reel in one device for use in a wide variety of harvesting machines and the like.

3,751,889

MOWING MACHINE

Albert Overesch, Spelle, Germany, assignor to Maschinenfabrik Bernard Krone GmbH, Spelle, Germany

Filed Oct. 22, 1971, Ser. No. 191,641

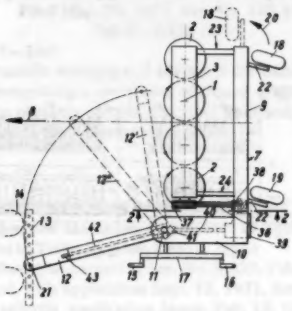
Claims priority, application Germany, Oct. 29, 1970, P 20 53 073.8

Int. Cl. A01d *35/26*

U.S. Cl. 56—13.6 **11 Claims**

Mowing machine with at least one mowing device driven so as to rotate around a generally vertical axis, the mowing device being mounted upon a supporting beam, and the mowing machine being designed as a trailer-type machine with a pull bar and ground-engaging supporting wheels. Each of the mowing devices is also supported on the ground by a supporting part. The supporting beam is braced by a system of guide

bars connected to a separate machine frame so as to be able to swing freely parallel to itself up and down; the ground-engaging supporting wheels and the pull bar are connected to the frame.

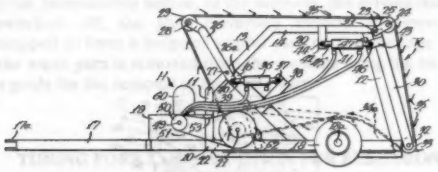


3,751,890

GROUND ENGAGING HAY BALE ROLLING APPARATUS

James E. Gay, and John W. Bliss, both of Vinton, Iowa, assignors to Starline, Inc., Harvard, Ill.

Filed June 17, 1971, Ser. No. 152,623
Int. Cl. A01d *75/00*
U.S. Cl. 56—16.4 21 Claims



A hay bale rolling apparatus adapted to be drawn along a swath or a windrow of hay behind a tractor to roll the windrow into a series of separate bales in contact with the ground. The apparatus is entirely hydraulically operated from a tractor hydraulic system and has a single two-position mechanical control valve to control a cycle of baling, bale release and return to baling. The valve may be actuated to release a bale manually by an operator on a tractor or automatically by a sensing means which directly senses the diameter of a bale; and is automatically returned from release position to baling position after a bale is released.

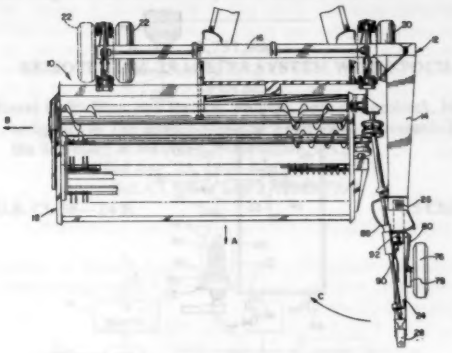
3,751,891

IMPLEMENT TRANSPORT STRUCTURE

Herbert W. Molzahn; Donald K. Tashiro, and Harold D. Ralph, all of Hamilton, Ontario, Canada, assignors to International Harvester Company, Chicago, Ill.

Filed Aug. 1, 1972, Ser. No. 277,011
Int. Cl. A01d *75/22*
U.S. Cl. 56—228 15 Claims

A pull-type crop harvester having a crop harvesting platform mounted on a wheeled frame. The platform is elongated transversely to the normal forward direction of travel during a crop harvesting operation. The frame includes a hitch tongue connectible to the towing tractor. The hitch tongue is pivotable to a position transverse to the forward direction of travel. A transport wheel is carried on the hitch tongue for engaging the ground when the hitch tongue is in the transverse position whereby the crop harvester may be towed in an endwise direction. An auxiliary hitch pole is connectible between an end of the harvester and the tractor for the endwise transport.

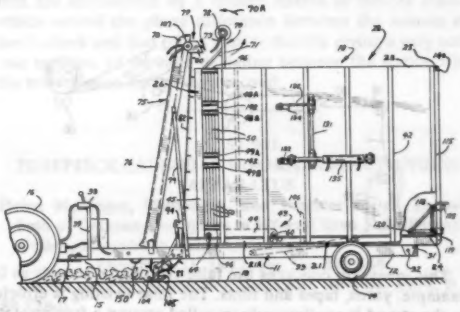


3,751,892

HAYSTACK MAKING MACHINE

Sherman H. Quanbeck, Aneta, N. Dak., and Harold T. Gleason, Tolna, N. Dak.

Filed May 14, 1971, Ser. No. 143,359
Int. Cl. A01d *89/00*
U.S. Cl. 56—344 17 Claims



A haystack making machine utilizing a hay pickup and an elevating conveyor, a haystack forming compartment, and linear movable compression packing means for packing the hay; all mounted on a frame. After a haystack has been formed means are provided for removing the haystack from the hay forming compartment.

3,751,893

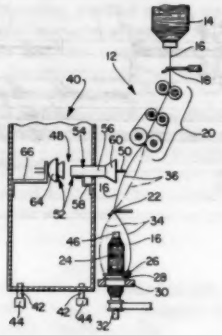
STRAND DETECTION

William V. Goodhue, North Kingstown, and Thomas E. Pitts, Cranston, both of R.I., assignors to Leesona Corporation, Warwick, R.I.

Filed Oct. 29, 1971, Ser. No. 193,683
Int. Cl. D01h *13/16*
U.S. Cl. 57—34 R 8 Claims

A tender patrols the spinning stations of a spinning frame and stops to service any station requiring attention. One reason for stopping the tender is because a strand normally spun into yarn has broken at a spinning station. In order to determine whether or not the strands are advancing normally at the spinning stations, the tender carries a transducer responsive to vibration of a feeler upon engaging the normally

advancing strands to actuate an electronic switch which provides a signal permitting the tender to continue its patrolling



operation. If a strand is not advancing normally the signal is not provided and the tender stops to service the station.

3,751,894

FALSE TWISTING OF YARNS

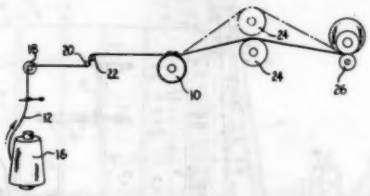
James Nelson Ruddell, Portadown, Northern Ireland, assignor to Lambeg Industrial Research Association

Filed Mar. 5, 1970, Ser. No. 16,915

Claims priority, application Great Britain, Mar. 17, 1969, 13,848/69; Mar. 8, 1969, 12,344/69; Mar. 17, 1969, 13,847/69

Int. Cl. D02g *1/02, 1/04*

U.S. Cl. 57—34 HS **15 Claims**



This invention concerns the false twisting of strands as for example, yarns, tapes and films. The false twisting is effected as the strand is continuously travelled around a freely rotatable roller in the form of a loop, the beginning and end of which constitutes a close simple knot in contact with the roller periphery. The frictional contact of the strand with itself at the knot causes false twist to run back in the strand. The stand leaves the roller in a non-tangential direction. This method of false twisting may be used as a substitute for known methods in the production of modified continuous filament yarns, or to produce preliminary or additive false twist in such cases; in the treatment of wet-spun linen yarns to improve their characteristics; and in the treatment of film either to separate preformed filaments therein or to fibrillate it.

3,751,895

METHOD AND APPARATUS FOR DONNING BOBBINS

Gordon C. Anderson, and William H. Drake, both of Clemson, S.C., assignors to Maremont Corporation, Chicago, Ill.

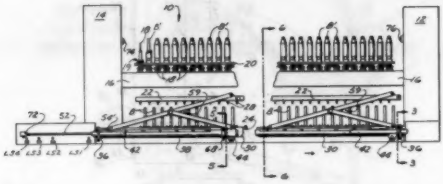
Filed Jan. 12, 1972, Ser. No. 217,316

Claims priority, application Great Britain, Nov. 18, 1971, 53,700/71

Int. Cl. D01h *9/00, 9/04*

U.S. Cl. 57—52 **7 Claims**

Automatic donning apparatus in a textile processing machine having a plurality of spindles for receiving bobbins, the apparatus comprising a plurality of bobbin graspers movable to a donning position axially aligned with the spindles and spaced above the spindles by a distance greater than the length of the bobbins to be donned, first control means for moving the graspers to their donning position, second control



means for sequentially actuating the graspers to grasp the bobbins and deactuating the graspers to release the bobbins, and means correlating the first and second control means to deactuate the graspers while they are in their donning position whereby the bobbins are donned on the spindles in self-aligning free fall.

3,751,896

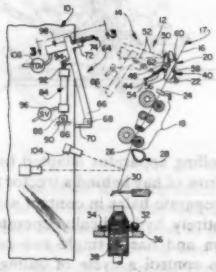
YARN HANDLING

Michael D. Ford, Warwick, R.I., assignor to Leesona Corporation, Warwick, R.I.

Filed June 21, 1971, Ser. No. 155,105

Int. Cl. D01h *13/18*

U.S. Cl. 57—87 **7 Claims**



Automatic servicing apparatus for spinning stations of one or more spinning frames includes provision for severing and clamping roving to stop feeding of the roving and to present a cleanly severed supply end of the roving in convenient position for subsequent thread-up. A carriage patrols the spinning stations and stops at any station requiring servicing, whereupon mechanism on the carriage doffs the bobbin being wound at the station, donns an empty bobbin core and normally starts the yarn spun from the roving winding onto the empty bobbin. If a station cannot be adequately serviced by the carriage mechanism a signal initiates operation of a scissor on the carriage and as the scissor is moved to an operative position for cutting the roving upstream of the drafting roll stand a roving clamp clamps the severed end of the roving extending from the roving supply. The scissor is then retracted and the station is rendered inoperative by the prior movement of a target on the clamp to a position in which a photo responsive sensor is not actuated so that the carriage subsequently by-passes the station.

3,751,897

ASBESTOS YARN REINFORCED WITH CONTINUOUS STRAND OF A POLYVINYL ALCOHOL

Gerald Dwight Bailey, Sea Bright, N.J., assignor to Johns-Manville Corporation, Denver, Colo.

Filed Mar. 29, 1971, Ser. No. 129,195
Int. Cl. D02g 3/20
U.S. Cl. 57—144 5 Claims

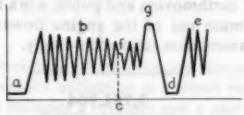
A high tensile strength and chemical resistant asbestos yarn product comprising a composite of a core strand composed of a spun yarn of staple polyvinyl alcohol fiber and with overlying staple asbestos fiber twisted thereabout.

3,751,898

PROCESS FOR WINDING YARN PACKAGE

Sanro Inaba, and Masakazu Fujita, both of Ehime-ken, Japan, assignors to Teijin Limited, Osaka, Japan

Continuation-in-part of Ser. No. 8,339, Feb. 3, 1970, abandoned. This application Sept. 15, 1971, Ser. No. 180,615
Claims priority, application Japan, Feb. 10, 1969, 44/9883
Int. Cl. B65h 54/34, 54/00
U.S. Cl. 57—156 5 Claims



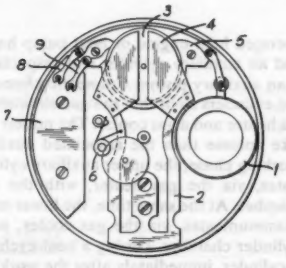
After a desired amount of yarn is wound on a package and the driving motor of a winding machine is switched off, waste yarn of a non-uniform quality which is produced after the driving motor stops, is wound on the surface of the package by inertia. Immediately before, or the moment, the driving motor is switched off, the yarn traversing motion is temporarily stopped to form a bulge of wound yarn on the package. Only the waste yarn is removed from the package using the bulge as a guide for the removal of the waste yarn.

3,751,899

TUNING FORK CONSTRUCTION FOR ELECTRONIC WRIST WATCHES

Yuki Tsuruishi, Suwa, Nagano-ken, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Sept. 7, 1971, Ser. No. 178,229
Claims priority, application Japan, Sept. 7, 1970, 45/77732; Sept. 30, 1970, 45/84974; Oct. 15, 1970, 45/01790 (utility model); Oct. 19, 1970, 45/91508; Oct. 20, 1970, 45/91819; Oct. 27, 1970, 45/06113 (utility model)
Int. Cl. G04c 3/02; H02k 33/00; H03b 5/36
U.S. Cl. 58—23 TF 23 Claims



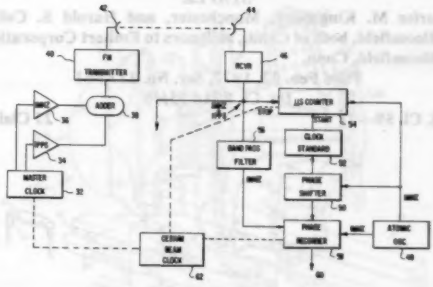
A tuning fork construction for electronic wrist watches including a substantially U-shaped tuning fork oscillator and a U-shaped magnetic circuit mounted at the end of each tine of said tuning fork, each of said magnetic circuits including a pair of mounting plates secured to the respective tine and carrying at least one substantially semicircular permanent magnet. A coil is positioned intermediate the mounting plates of both of said magnetic circuits in the path of the flux thereof.

3,751,900

REMOTE TIME TRANSFER SYSTEM WITH EPOCH PULSE

David H. Phillips, and Ruth E. Phillips, both of Accokeek, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 23, 1971, Ser. No. 136,779
Int. Cl. G04c 13/02; H04b 7/00
U.S. Cl. 58—24 R 5 Claims



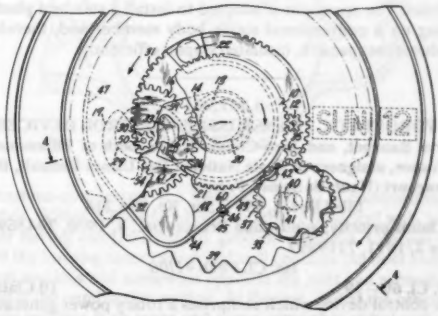
A passive method and equipment for synchronizing time systems, atomic or precision clocks, by transferring both time and frequency information. The time and frequency information are transmitted by a master station to remote stations which record the phase difference between the remote station's clock and that of the master thereby giving a very accurate measure of the time deviation between the station when the transmission delays are removed.

3,751,901

TIMEPIECE CALENDAR INFORMATION CHANGING APPARATUS

Heinz Meltinger, Mutlangen, and Joachim Lietze, Eschach, both of Germany, assignors to Bifora-Uhren J. Bidlingmaier GmbH, Schwabisch Gmund, Germany

Filed Nov. 21, 1972, Ser. No. 308,508
Claims priority, application Germany, Nov. 26, 1971, P 21 58 728.0
Int. Cl. G04b 19/24
U.S. Cl. 58—58 24 Claims



Apparatus for periodically changing calendar information displayed in a timepiece while holding the information-carrying elements motionless between successive changes to insure that the current day and date are properly displayed. A cam

mechanism connects the element or elements to the time measuring components of the timepiece so as to allow relative movement therebetween during the interval between successive day and date changes but to impart a quick advancing motion to the elements at the end of the interval to display the next succeeding day and date. A positive drive connection is thus always maintained with the information-carrying elements, notwithstanding that they are moved only intermittently. The cam mechanism also permits turning back of the day element for resetting purposes and provision is made for adjustment of the date element independently of the day element.

3,751,902

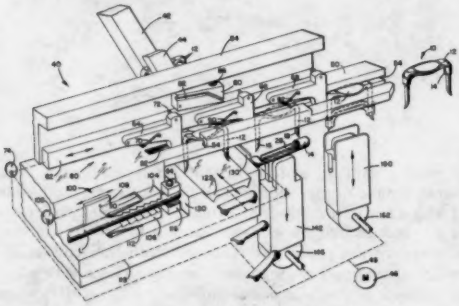
APPARATUS FOR INSTALLING INSULATION ON A STAPLE

Charles M. Kingsbury, Manchester, and Harold S. Colby, Bloomfield, both of Conn., assignors to Emhart Corporation, Bloomfield, Conn.

Filed Feb. 22, 1972, Ser. No. 227,861

Int. Cl. B21d *53/46*

U.S. Cl. 59—71 **21 Claims**



An apparatus for installing insulation on a U-shaped metallic body member to form an insulated staple. The apparatus receives both the U-shaped body member and a section of tubing, and assembles the tubing on the body member so that the staple can be driven into a supporting object and attach a conduit captured by the staple to the object without having direct physical contact between the metallic body member and the conduit. The apparatus assembles insulating tubing on the U-shaped body member so that the portion of the member which receives the blows of a hammer during a stapling operation is openly exposed and the inner periphery of the U-shaped member adjacent the captured conduit is entirely covered by the walls of the tubing which provides the insulating characteristics. The apparatus is adapted to install a standard plastic tubing on a conventional staple body member and, thereby, produces inexpensive, insulated staples efficiently.

3,751,903

HYDROSTATIC TRANSMISSION CONTROL DEVICES

Pierre Bauchet, and Jean-Claude Carre, both of Billancourt, France, assignors to Regie National Des Usines Renault, Billancourt (Hauts de Seine), France

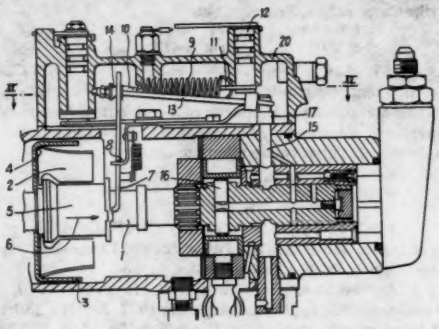
Filed Dec. 2, 1971, Ser. No. 204,214

Claims priority, application France, Dec. 4, 1970, 7043696; June 2, 1971, 7119897

Int. Cl. F02b *41/00*

U.S. Cl. 60—19 **10 Claims**

A control device which comprises a rotary power generator such as a thermal engine of which the momentary torque is subordinate to the position of an adjustment member, and a variable-ratio hydraulic transmission, the position of said adjustment member being measured in a manner known per se by a proximity detector of which the output signal is fed to a governor assembly controlling the increment or the reduction in the transmission ratio if the engine torque is higher or lower with respect to a reference value.



The control device is applicable notably to farming machines and earthmoving and public work machines, and affords an optimum use of the engine power output by controlling the transmission ratio accordingly.

3,751,904

HEAT ENGINES

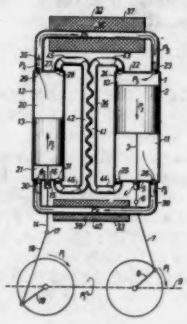
Sigge Rydberg, Konstgjutarvagen 24, Johanneshov, Sweden

Filed Sept. 23, 1971, Ser. No. 183,210

Claims priority, application Sweden, Sept. 25, 1970, 13082/70

Int. Cl. F02g *1/04*

U.S. Cl. 60—24 **14 Claims**



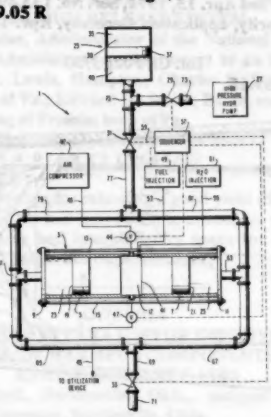
A gas operated heat engine or heat pump having a master cylinder and an auxiliary cylinder and respectively a master piston and an auxiliary piston. Connecting lines are arranged between the cylinders such that the gas circulates in a system having a gas heater and a gas cooler. The master cylinder has a larger stroke volume than the associated auxiliary cylinder. During a working phase, the upper auxiliary cylinder chamber communicates, via the gas heater, with the upper master cylinder chamber. At the same time, the lower master cylinder chamber communicates, via the gas cooler, with the lower auxiliary cylinder chamber. During a heat-exchange phase of the master cylinder, immediately after the working phase, the upper chamber in the master cylinder communicates, via a first side of a heat exchanger, with the lower chamber in the master cylinder, while at the same time the lower chamber in the master cylinder communicates, via a second side of said heat exchanger, with the upper auxiliary cylinder chamber.

3,751,905

GAS-STEAM GENERATING APPARATUS

Roe L. McKinley, and Jack M. McKinley, both of P.O. Box 1342, Longview, Tex.

Filed Aug. 26, 1971, Ser. No. 175,304
Int. Cl. F02g 3/02
U.S. Cl. 60—39.05 R 9 Claims



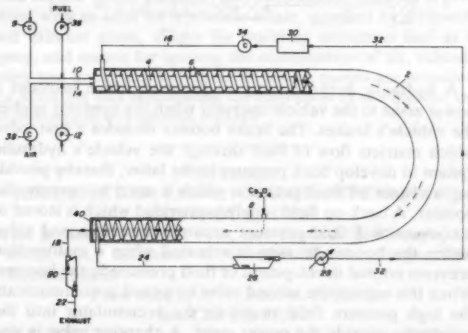
Apparatus for generating a high pressure mixture of steam and combustion gases for utilization at a steam engine or the like. The apparatus includes a cylinder and a pair of opposed pistons movable toward and away from each other in the cylinder. The space between pistons comprises a combustion chamber, and an hydraulic fluid is present behind each cylinder, together with an hydraulic sub-system for regulating the pressure therein. An hydraulic accumulator in the sub-system is pressurized from a high pressure fluid source, the pressurized fluid from the accumulator then being used to drive the pistons together to heat and compress an air charge therebetween. Fuel is injected and ignites, and thereupon water is injected and spontaneously vaporizes to steam. The steam-gas mixture drives the pistons outwardly, displacing the hydraulic fluid to the accumulator. An exhaust valve at the combustion chamber now opens, and the pistons, driven by accumulator pressure, force the gas-steam mixture from the apparatus toward a utilization point.

3,751,906

POLLUTION CONTROLLER

Lawrence E. Leas, Simi, Calif.; Robert L. Leas, and Cecil J. Johnson, both of Columbia City, Ind., assignors to Leas Brothers Development Corporation, Columbia City, Ind.

Continuation-in-part of Ser. No. 2,450, Feb. 11, 1970, abandoned. This application Feb. 22, 1972, Ser. No. 227,768
Int. Cl. F02c 7/30; F23c 9/02
U.S. Cl. 60—39.02 5 Claims



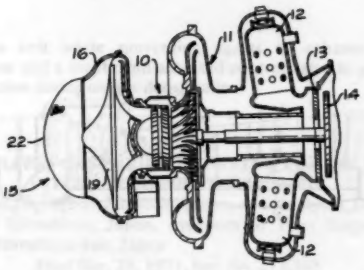
A method for decreasing or eliminating exhaust emissions of nitrogen oxides, unburned hydrocarbons, carbon monoxides, or the like. The combustion temperature is maintained at a sufficiently low level to prevent the formation of nitrogen oxides. The exhaust gases are reacted with a metal oxide for the removal of contaminants, unburned hydrocarbons and carbon monoxide.

3,751,907

INERTIAL AIR CLEANER FOR GAS TURBINE

Howard R. Anderson, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 8, 1971, Ser. No. 205,978
Int. Cl. F02g 3/00; B01d 45/12
U.S. Cl. 60—39.09 P 12 Claims



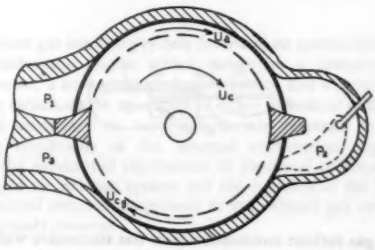
The air intake to a gas turbine comprises a plurality of stationary, spiralled blades mounted therein for centrifugally discharging dirt ladened air radially outwardly to a restricted passageway which communicates with a collector. Clean air enters a larger, circumferentially disposed passageway positioned inwardly of the restricted passageway to communicate substantially clean air to the compressor stage of the turbine.

3,751,908

TURBINE-COMPRESSOR

Gene T. Colwell, Tucker, Ga., and Thomas W. Jackson, Arlington, Va., assignors to Georgia Tech Research Institute, Atlanta, Ga.

Filed June 23, 1971, Ser. No. 155,865
Int. Cl. F02c 3/04; F01d 1/36; F03b 5/00
U.S. Cl. 60—39.43 10 Claims



A turbine-compressor for feeding a gas to a combustion chamber. Within a housing having an inner cylindrical wall, is a rotor having circumferentially grooved passages. One portion of the housing inner cylindrical wall contains the inlet and exhaust sections and somewhat opposite the inlet and exhaust section is the combustion section. At the one, and at the other of these sections is an inner and outer, somewhat radial wall, having an adjustable orientation. These radial walls have teeth which enter the circumferentially grooved passages making a substantially sealed contact with the rotor. These walls and teeth form gas flow guides. The rotor is rotated at over about 1100 feet per second, forcing the gas into the combustion

chamber where burning occurs. The fluid then reenters the casing through a nozzle and expands through the turbine side of the casing.

3,751,909

TURBOJET AERO ENGINES HAVING MEANS FOR ENGINE COMPONENT COOLING AND COMPRESSOR CONTROL

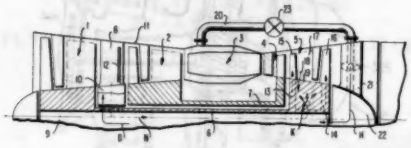
Gottfried Kohler, Friedrichshafen, Germany, assignor to MTU Munich GmbH, Munich, Germany

Filed Aug. 26, 1971, Ser. No. 175,210

Claims priority, application Germany, Aug. 27, 1970, P 20 42 478.6

Int. Cl. F04d 27/00; F02c 7/12

U.S. Cl. 60—39.17 **19 Claims**



This invention relates to gas turbine engines, and, more particularly, to multishaft turbojet aero engines having a plurality of compressors and turbines, in which air is bled from one or several compressors in the engine for cooling engine components and for providing a seal between the rotary and stationary assemblies of the several rotor systems, and in which means are additionally provided for compressor control.

3,751,910

COMBUSTION LINER

Ralph B. Sweeney; John M. Vaught, and Albert J. Verdouw, all of Indianapolis, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 25, 1972, Ser. No. 229,411

Int. Cl. F02c 7/18

U.S. Cl. 60—39.65 **3 Claims**

A gas turbine combustion liner has successive wall sections which define between them entrances for film cooling air which flows rearwardly along the inside of the liner in the same direction as the combustion products. The forward liner section is telescoped within the rearward one, and the rear portion of the forward liner section is tapered inwardly so that the gap between the two diverges radially in the direction of flow to diffuse the air flowing through the film cooling entrance. The overlapping portions of the liners are joined by a zigzag strip wbich is tapered to conform to the divergence of the passage walls, alternate lands of the strip being fixed by spot welding and brazing to the inner section and the lands between these having tabs extending from them which are spot welded and brazed to the outer liner section.

3,751,911

AIR INLET ARRANGEMENT FOR GAS TURBINE ENGINE COMBUSTION CHAMBER

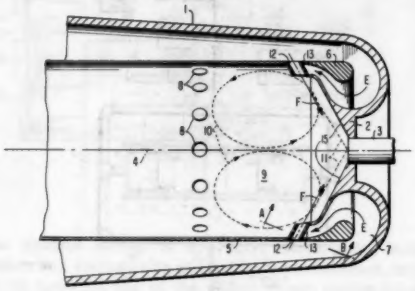
Peter De Tartaglia, Munich-Karlsfeld, Germany, assignor to Motoren-Und Turbinen Union Munich GmbH, Munich, Germany

Filed Apr. 13, 1971, Ser. No. 133,492

Claims priority, application Germany, Apr. 18, 1970, P 20 18 641.8

Int. Cl. F02g 3/00

U.S. Cl. 60—39.65 **15 Claims**



A combustion chamber to gas turbine engines equipped with a flame tube provided with air inlet openings for combustion and mixing air; further air inlet openings are provided in the flame tube at the level of the combustion chamber end wall, through which small quantities of air are adapted to be blown radially inwardly toward the discharge point of the fuel injection nozzle.

3,751,912

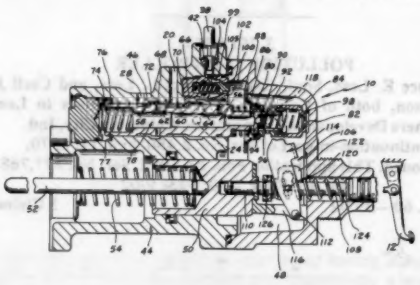
HYBRID BRAKE BOOSTER USING CHARGING VALVE

Lloyd G. Bach, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Continuation-in-part of Ser. No. 172,803, Aug. 18, 1971. This application Feb. 10, 1972, Ser. No. 225,166

Int. Cl. F15b 7/00, 13/10; F03c

U.S. Cl. 60—54.5 P **5 Claims**



A hydraulic brake booster is disclosed which provides a power assist to the vehicle operator when the operator applies the vehicle's brakes. The brake booster includes a first valve which restricts flow of fluid through the vehicle's hydraulic system to develop back pressure in the latter, thereby providing a source of fluid pressure which is used to operate the booster. A back-up fluid supply is provided which is stored in a conventional fluid pressure accumulator. A second valve within the booster housing is actuated when a malfunction prevents normal development of fluid pressure in the booster. When this occurs, the second valve is opened to communicate the high pressure fluid stored in the accumulator into the booster to provide the power assist. A charging valve is also provided in the vehicle's hydraulic system which is adapted to

develop back pressure in the latter to communicate at least a portion of the fluid flowing through the system into the accumulator to charge the latter when the hydraulic system functions normally.

3,751,913

BARIUM RELEASE SYSTEM

Thomas O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Beverley W. Lewis, Hampton; Charles S. Stokes, Willow Grove, both of Va.; Edward W. Smith, Exton, and William J. Murphy, King of Prussia, both of Pa.

Filed July 31, 1970, Ser. No. 59,892

Int. Cl. C06d *5/06*

U.S. Cl. 60—215 **2 Claims**

A chemical system for releasing a good yield of free barium (Ba^*) atoms and barium ions (Ba^+) to create ion clouds in the upper atmosphere and interplanetary space for the study of the geophysical properties of the medium.

3,751,914

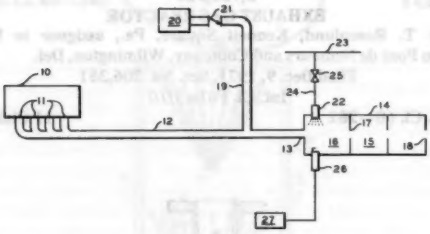
PROCESS AND APPARATUS FOR IMPROVING THE REMOVAL OF HARMFUL COMPONENTS FROM ENGINE EXHAUST GASES

Lyle W. Pollock, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 27, 1971, Ser. No. 183,886

Int. Cl. F02b *75/10*

U.S. Cl. 60—284 **5 Claims**



In the operation of an internal combustion engine, the catalyst bed of a catalytic muffler can be brought more rapidly to its effective operating temperature during the warmup period by combining, just after the engine start-up, the exhaust gases with air and unburned fuel, igniting the mixture and passing the hot combustion products in direct heat exchange with the cold catalyst bed. The process is interrupted when a period of time has elapsed so that a portion of the catalyst bed has been elevated to a temperature sufficiently high so as to be effective.

A catalytic muffler equipped with an interconnected combustion chamber and catalyst-containing chamber may be used for the above purpose. The combustion chamber is provided with an inlet for a mixture of air, supplied by a blower, and exhaust gases, means for injecting unburned fuel as a spray, and means for igniting the combination of air, exhaust gases and unburned fuel. Suitable timing means are provided for initiating and terminating the operation of the blower, injection means and ignition means.

3,751,915

AIR INDUCTION VALVE FOR EXHAUST EMISSION CONTROL SYSTEM

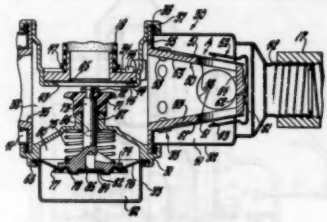
Ernst L. Ranft, Webster, N.Y., and Kenneth R. Pfrengle, Atlanta, Ga., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 1, 1971, Ser. No. 119,508

Int. Cl. F02b *75/10*

U.S. Cl. 60—290 **8 Claims**

An air induction valve for use in the air injection unit of an exhaust emission control system for an internal combustion engine in which exhaust pressure pulsations are used to induce air flow through the air injection unit, the air induction valve including check valves to permit the ingress of air into the air



injection unit while preventing egress of exhaust gases therefrom and a diaphragm actuated control valve to prevent air injection during engine deceleration.

3,751,916

EXHAUST GAS PURIFYING SYSTEM FOR USE IN INTERNAL COMBUSTION ENGINE

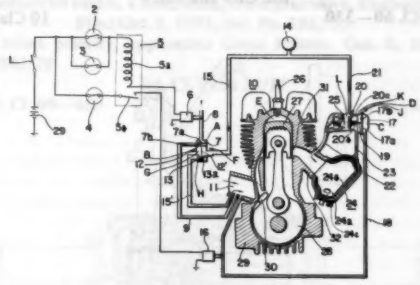
Motoyuki Hayashida, Hironobu Inoue, and Kuniyuki Toyama, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima-ken, Japan

Filed Dec. 29, 1971, Ser. No. 213,565

Claims priority, application Japan, Dec. 29, 1970, 45/135555

Int. Cl. F02b *75/10*

U.S. Cl. 60—289 **7 Claims**



An exhaust gas purifying system for use in an automobile internal combustion engine which comprises a primary air supply device, a secondary air supply device and a switching device for switching the operation of either or both of said primary and secondary air supply devices in response to the operating conditions of the internal combustion engine, whereby the substantial elimination of abnormal combustion occurring in the exhaust system and the emission of the noxious unburned compounds present in the exhaust gas can be advantageously ensured.

3,751,917

EXHAUST CHAMBER FOR A MOTOR VEHICLE PROVIDED WITH AN INTERNAL COMBUSTION ENGINE

Giampaolo Garcea, Milan, Italy, assignor to Alfa Romeo S.p.A., Milan, Italy

Filed Oct. 13, 1971, Ser. No. 188,777

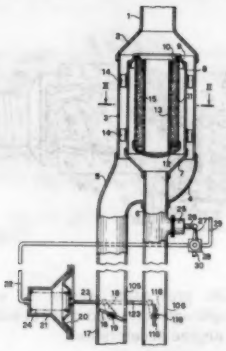
Claims priority, application Italy, Oct. 24, 1970, 7343 A/70

Int. Cl. F01n *3/14*

U.S. Cl. 60—288 **5 Claims**

An exhaust chamber for internal combustion engines of motor vehicles, in which the exhaust gases, before being discharged to the atmosphere, are passed through one of two coaxial chambers, with the inner chamber being filled with a

suitable catalyst for the combustion of unburnt substances, depending on the load condition of the engine, so that the



catalyst is contacted by these exhaust gases only at low working power.

3,751,918

SECURING ARRANGEMENT OF STATOR SHAFT AT TORQUE CONVERTER HOUSING OF A HYDRODYNAMIC TORQUE CONVERTER

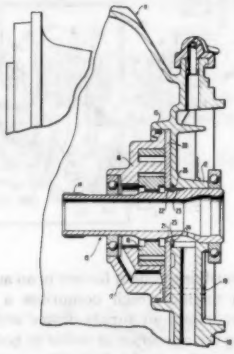
Josef Helmer, Aich, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Untertuskheim, Germany

Filed Nov. 30, 1971, Ser. No. 203,338

Claims priority, application Germany, Dec. 1, 1970, P 20 58 994.0

Int. Cl. F16h *41/24*

U.S. Cl. 60—330 **10 Claims**



Attachment of the stator shaft at a torque converter housing in a hydrodynamic torque converter in which, with the use of a pressure oil pump housing secured at a radial wall of the torque converter housing, the stator shaft is non-rotatably secured at a pump housing side wall which is rigidly clamped between the pump housing and the radial wall.

3,751,919

HYDRAULIC POWER BRAKE BOOSTER MOTOR

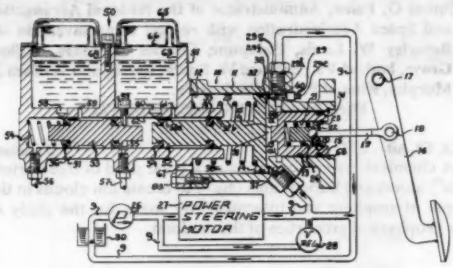
Benjamin Ron, Tel-Aviv, Israel, assignor to Samuel Shiber, Chicago, Ill.

Continuation-in-part of Ser. No. 34,143, May 4, 1970, abandoned. This application Oct. 15, 1970, Ser. No. 80,899

Int. Cl. F15b *7/00, 13/10*

U.S. Cl. 60—54.5 P **12 Claims**

A hydraulic booster motor adapted to be connected to and to activate a vehicle's master cylinder which is connected to a hydraulic braking system, the booster's valve body defines two coaxial bores, the large bore carries a power piston which is slidable in it and powertransmittingly connected to the primary piston of the master cylinder, and the small bore carries a reaction piston which is slidable in it and powertransmittingly connected through a linkage to the brake pedal of the vehicle,



the booster valve body, together with the two pistons it carries, define a variable volume into which fluid flow is forced through an inlet port and which leaves the variable volume through an exhaust passage which is restricted when driver pushes the brake pedal with his foot.

3,751,920

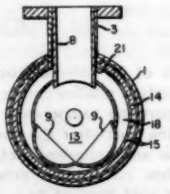
EXHAUST GAS REACTOR

Iver T. Rosenlund, Kennett Square, Pa., assignor to E.I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 9, 1971, Ser. No. 206,351

Int. Cl. F01n *3/10*

U.S. Cl. 60—282 **11 Claims**



Hydrocarbon, carbon monixide, and nitrogen oxide pollutants emitted by post oxidation type exhaust gas reactors can be substantially reduced by redirecting the exhaust gases as they enter the reactor through the use of deflectors of special design and the optional use of improved means for directing the gases onto said deflectors.

3,751,921

EXHAUST SILENCER FOR INTERNAL COMBUSTION ENGINES

Folke Ivar Blomberg, 18140 Lidingo, 4 Duvstigen, and Per Gunnar Brynge, 561 00 Huskvarna, Varpehus, both of Sweden

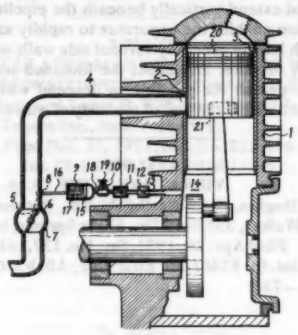
Filed May 10, 1971, Ser. No. 141,752

Int. Cl. F01n *1/18*

U.S. Cl. 60—324 **4 Claims**

A system for reducing the sound level of engine exhaust gases and arranged to be actuated in dependence of one of the physical magnitudes produced by the engine, such as gas pressure, engine temperature and like magnitudes. The system is provided with a baffle means located on the exhaust side of

the engine and baffle actuating means disposed between the baffle means and the engine and adapted to adjust the setting



of the baffle means in response to variations in said physical magnitude.

3,751,922

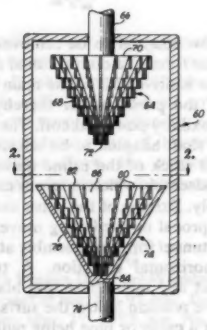
HYDRAULIC TRANSMISSION

Harold L. Cottrell, 4345 Brookie Ct., Columbus, Ohio

Division of Ser. No. 839,158, July 7, 1969, Pat. No. 3,613,366. This application Sept. 13, 1971, Ser. No. 179,842

Int. Cl. F16h *41/04*

U.S. Cl. 60—349 **1 Claim**



A hydraulic transmission unit including, within a sealed, fluid filled container, a pair of shafts rotatably mounted in the container and extending therefrom, a conical male impeller on one of the shafts and a conical female turbine on the other shaft, the shafts being relatively shiftable axially away from an initial, substantially spaced apart position into a position wherein the impeller and the turbine are in closer proximity than in the initial position.

3,751,923

VALVE CONTROLLED HYDRAULIC COUPLING

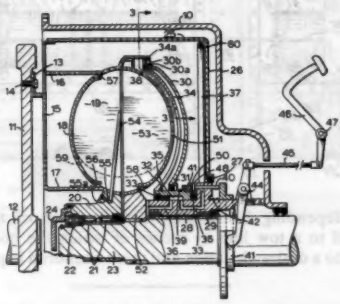
John E. Becker, Bowmanville, Ontario, Canada, assignor to Eclipse Consultants Limited, Oshawa, Ontario, Canada

Filed Feb. 11, 1972, Ser. No. 225,514

Int. Cl. F16h *41/20*

U.S. Cl. 60—359 **15 Claims**

A hydraulic coupling is provided with a reservoir compartment connected to the working compartment via a valve controlled by the operator in order to control the torque transmission capacity of the coupling. This valve comprises a spoked dished member which is mounted for movement along the coupling axis and is movable by the operator's control to open valve orifices disposed at the end of the spokes and thereby permit the working liquid to flow by centrifugal action from the working compartment into the reservoir compartment. Working liquid in the reservoir compartment is returned to the working compartment by a scoop tube including a valve device that is closed as the first mentioned valve is opened. The coupling may also include another reservoir chamber into



which working fluid empties automatically upon existence of a stall condition. A vent may be provided from the exterior of the coupling to a portion of working circuit where there is no circulation of fluid, thereby avoiding any pressure build up under stall conditions in the interior of the coupling, and permitting lighter construction for the coupling.

3,751,924

HYDROSTATIC TRANSMISSIONS

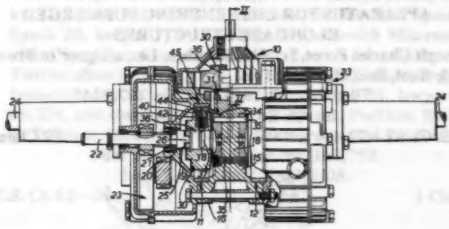
Peter Henry Brown, and Derek Ivor Webb, both of Cheltenham, England, assignors to Hydro-Mite Limited, Lansdown Industrial Estate, Cheltenham, Gloucestershire, England

Filed Oct. 5, 1971, Ser. No. 186,753

Claims priority, application Great Britain, Oct. 8, 1970, 47,882/70

Int. Cl. F15b *39/16*

U.S. Cl. 60—485 **3 Claims**



A hydrostatic transmission comprising a rotary radial piston pump combined with a rotary radial piston motor, each rotary unit comprising a rotary cylinder member mounted on a non-rotating pintle having fluid ports formed therein, the pintles of the two rotary units being separately formed and attached to a common housing or support.

3,751,925

FLOATING OIL CONTAINMENT BOOM

Robert K. Thurman, Linwood, Wash., assignor to Merritt Division of Murphy Pacific Marine Salvage Company, New York, N.Y.

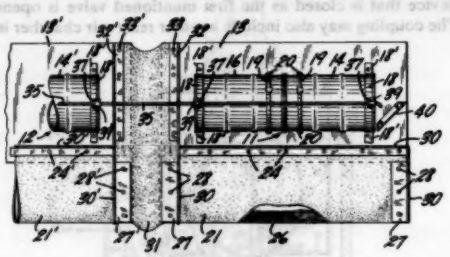
Filed Oct. 7, 1970, Ser. No. 78,801

Int. Cl. E02b *15/04*

U.S. Cl. 61—1 F **9 Claims**

A floating boom for containing oil and the like spilled on a body of water comprises a plurality of interconnected, floating units each supporting a rigid vertical barrier with a part above water and a part submerged. The barriers are interconnected

by panels of flexible waterproof material of substantially the same vertical extent as the barriers and both the barriers and the interconnecting panels have flexible, waterproof skirt portions depending below the barriers. Each of the units is secured to a tow line by means of which the boom may be towed to a desired location and there anchored in place.



3,751,926

METHOD OF ERECTING WALL STRUCTURES IN MINE WORKINGS

Rudolf Muller, Friedrichsthal, and Herbert Zenner, Siersburg, both of Germany, assignors to Gebr. Knauf Westdeutsche Gipswerke Saarbergwuerke Aktiengesellschaft, Iphofen, Germany

Filed Nov. 12, 1970, Ser. No. 89,112

Claims priority, application Germany, Nov. 14, 1969, P 19 57 263.5

Int. Cl. E02d *3/12*

U.S. Cl. 61—36 R **28 Claims**

A gypsum cement mixture which can be pumped underground for forming wall structures in mine workings comprising a material improving the flow properties of the gypsum cement-water mixture, an additive endowing hydrophobic properties, a colloid which is at the most weakly ionogenic, and a latently hydraulic material.

3,751,927

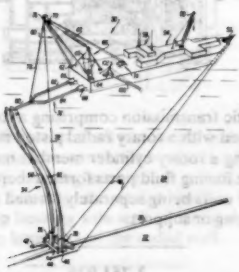
APPARATUS FOR ENTRENCHING SUBMERGED ELONGATE STRUCTURES

Joseph Charles Perot, Jr., Natchitoches, La., assignor to Brown & Root, Inc., Houston, Tex.

Filed Feb. 22, 1972, Ser. No. 227,844

Int. Cl. E02f *5/02*; F16l *1/00*

U.S. Cl. 61—72.4 **19 Claims**



An apparatus for entrenching submerged elongated structures such as pipelines and the like, including a skid frame having port and starboard pontoon runners with a box frame operable to bridge the pontoon runners over a pipeline to be entrenched. The box frame includes a first and second set of upper and lower pontoon spanning supports. Each of the supports includes inwardly facing port and starboard guide rails. Vertically and horizontally adjustable port and starboard cutter and eductor heads are ruggedly supported from the box frame guide rails and extend in close proximity to the surfaces of a pipeline to be entrenched. The port and starboard cutter and eductor heads both have a generally vertical-slant-vertical configuration so that the cutter and eductor heads extend along the lateral surfaces of the pipeline, slope beneath the pipeline and extend vertically beneath the pipeline. The head configuration enables the apparatus to rapidly and efficiently cut a trench having generally vertical side walls within the bed of the body of water and educt the loosened soil or detritus material to permit the pipeline to descend within a narrow walled trench within the bed of the body of water.

3,751,928

VIBRATORY PLOW

Robert E. Hughes, 5609 Northfield Rd., Bethesda, and Emmert K. Walker, 335 Scott Dr., Silver Springs, both of Md.

Filed Apr. 26, 1971, Ser. No. 137,141

Int. Cl. F16l *1/00*; E02f *5/02*; A01b *3/64*

U.S. Cl. 61—72.5 **13 Claims**

A vibratory plow adapted to be removably mounted to a prime mover in the form of a conventional digger or trencher such that the plow is driven off of the main drive sprocket or power takeoff of the prime mover thereby eliminating any necessity for an auxiliary power takeoff. The plow comprises a hollow mounting shaft adapted to be telescopically arranged relative to the tail stock of the prime mover and further including a driving assembly which in turn is movably connected to a yoke assembly. Driving of the drive assembly by a drive chain causes reciprocal or oscillating movement of the yoke assembly and the tunnel forming assembly attached thereto, in a substantially horizontal direction. A tunnel is thereby formed by a bullet and interconnecting blade member positioned in operative relation below the surface of the ground. Means to connect a cable or pipe being pulled by the plow is movably connected to the tunnel forming assembly.

3,751,929

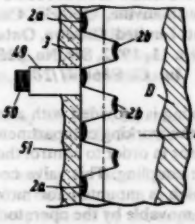
METHOD OF SUPPORTING EXPOSED GROUND OR ROCK

Jean P. Bernold, Walenstadt, Switzerland, assignor to Hans Walter Pfeiffer, a part interest

Division of Ser. No. 798,747, Feb. 12, 1969, Pat. No. 3,601,945. This application Aug. 11, 1971, Ser. No. 170,770

Int. Cl. E04c *2/42*; E21d *5/00*

U.S. Cl. 61—42 **1 Claim**



A method of supporting exposed ground or rock including the steps of establishing a formwork of special corrugated

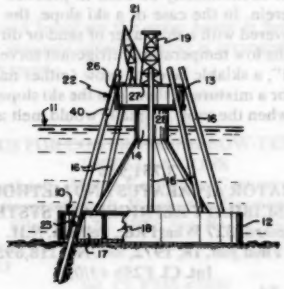
panel units in a spaced relationship with the exposed ground or rock and back-filling the space between the ground or rock and the formwork with sprayed concrete is disclosed herein.

3,751,930

ARTICULATED MARINE STRUCTURE WITH PREPOSITIONED ANCHORING PILES

George E. Mott, and James P. Wilbourn, New Orleans, La., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 27, 1971, Ser. No. 212,074
Int. Cl. E02b *17/00*; E02d *11/00*
U.S. Cl. 61—46.5 2 Claims



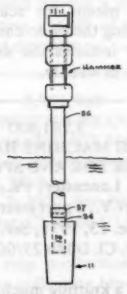
The invention relates to a marine structure for use in an offshore body of water where piling is required to hold the structure in place. It relates in particular to a floatable marine structure which is sufficiently buoyant to be floated to an offshore working site carrying a plurality of positioning piles thereon. At the site at least a part of the structure is ballasted to sink to the ocean floor, the prepositioned piles are thereafter sequentially driven into the substratum.

3,751,931

PILING

Stanley Merjan, 16 Beacon Dr., Port Washington, N.Y.

Continuation-in-part of Ser. No. 97,997, Dec. 14, 1970. This application Mar. 17, 1972, Ser. No. 235,790
Int. Cl. E02d *5/30*, *5/48*; E08d *5/50*
U.S. Cl. 61—53 20 Claims



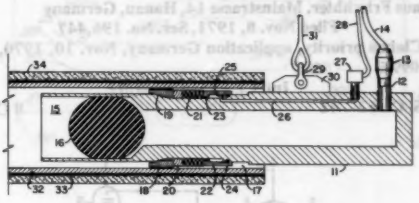
A concrete pile fitted with a special slightly tapered concrete tip of larger area. The tip has a central stub with an open socket for receiving concrete poured in after the pile is in place.

3,751,932

RECOVERY AND REPAIR OF OFFSHORE PIPELINES

Jamie F. Matthews, Jr., Houston, Tex., assignor to Esso Production Research Company, Houston, Tex.

Filed Feb. 16, 1972, Ser. No. 226,778
Int. Cl. F16l *1/00*, *55/12*
U.S. Cl. 61—72.1 20 Claims



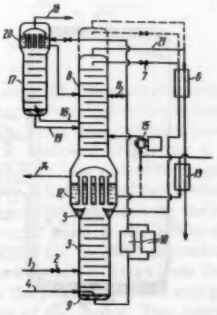
The end of an underwater pipeline is recovered from the bottom of a body of water by inserting a pigging element into the end of the pipeline, injecting a gas into the end of the line behind the pigging element until a section of the line sufficiently long to reach to the surface of the body of water has been voided of liquids, and thereafter lifting the end of the line to the water's surface. Apparatus which is particularly useful in such recovery operations includes a housing closed at one end and open at the other, a gas inlet in the housing near the closed end, means near the open end for engaging the end of a pipe and forming a seal therewith, a pigging element in the housing between the gas inlet and open end, and means for attaching a cable to the end of the pipeline for lifting the pipeline to water's surface.

3,751,933

METHOD OF AIR SEPARATION INTO OXYGEN AND ARGON

Georgy Matveevich Balabaev, ulitsa Shevchenko, 64-A, kv. 56; Viktor Sergeevich Boiko, 20106 I Slobodskaya ulitsa, 9-A, kv. I3; Viktor Matveevich Malchenko, 20109 ulitsa Spassky Spusk 20, korpus 7, kv. II; Stepan Nikolaevich Misarenko, ulitsa Novo-Sportivnaya, 65, kv. 8I; Luvish Avrum-Abovich Tsitrin, ulitsa Krylova, I2, 4, kv. 25, all of Nikolaev; Evgeny Ivanovich Borzenko, ulitsa Bukharestskaya, 3I, korpus 3, kv. II4, and Georgy Anatolievich Golovko, Pushkin, Bulvar A. Tolstogo, I6, kv. I29, both of Leningrad, all of U.S.S.R.

Filed July 15, 1971, Ser. No. 162,792
Int. Cl. F25j *3/02*, *3/03*, *3/08*
U.S. Cl. 62—29 1 Claim



A method of air separation into oxygen and argon in double rectification columns with the drawing off of liquid or gaseous oxygen and simultaneous obtaining of argon by withdrawing a fraction of raw argon from one of the plates of the upper recti-

fying column, with a portion of the liquid oxygen flow being returned to said rectifying column onto a plate thereof that is located below the raw argon fraction withdrawal zone whereby a forced circulation flow of liquid oxygen is created.

3,751,934

CONCENTRATING KRYPTON AND XENON IN AIR SEPARATION BY LIQUID OXYGEN WASH

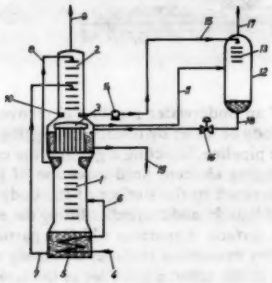
Klaus Frischbier, Mainstrasse 14, Hanau, Germany

Filed Nov. 8, 1971, Ser. No. 196,447

Claims priority, application Germany, Nov. 10, 1970, P 20 55 099.6

Int. Cl. F25j *3/02, 3/03*

U.S. Cl. 62—41 **8 Claims**



In air separation, oxygen containing krypton, xenon and hydrocarbons is passed from the rectifying column to a separator where as a rising gas it is washed with a controlled downflow of liquid oxygen drawn from above the sump liquid in the column. The controlled washing permits gaseous oxygen and some methane to leave the separator top while krypton and xenon are trapped in the wash liquid which returns from the separator bottom to the column sump. Thus enriched sump liquid is withdrawn for further processing to recover krypton and xenon.

3,751,935

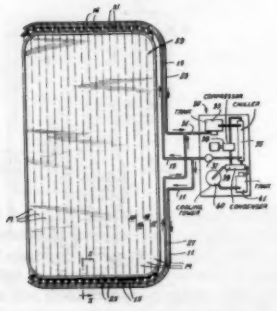
METHOD AND SYSTEM FOR CREATING AND MAINTAINING AN ICE SLAB

Calvin D. MacCracken, Fort Lee, and Helmut J. Schmidt, Oakland, both of N.J., assignors to Calmac Manufacturing Corporation, Englewood, N.J.

Filed Dec. 2, 1971, Ser. No. 204,112

Int. Cl. A63c *19/10*

U.S. Cl. 62—75 **16 Claims**



Method and system for creating and maintaining an ice slab for skating purposes, or an ice chute for a toboggan slide, or for maintaing a layer of snow for skiing. The system includes pluralities of small diameter flexible plastic tubes arranged in grids in portable mats with the tubes placed close to one another and arranged with each input or supply tube portion closely adjacent to an outlet or return tube portion providing an advantageous uniform temperature effect at a small distance above the tubes. A low temperature anti-freeze liquid is pumped through the tubes to provide the desired uniform cooling effect, and the portable mats each include a pair of sub-headers which can conveniently be coupled together with main headers to form a large grid the size of an ice skating rink, or a ski slope. For a rink these small flexible tubes may thereafter be covered with a thin layer of sand, or other protective material, and water is then introduced into the rink and is frozen by the low temperature refrigerant passing through the various tubes. By virtue of the small diameter of the tubes, ethylene glycol or other similar low temperature anti-freeze liquid (which would be very expensive with conventional systems) can economically be used to practice the invention disclosed herein. In the case of a ski slope, the small flexible tubes are covered with a thin layer of sand or dirt, and the circulation of the low temperature refrigerant serves to maintain, i.e. to "hold", a skiable layer of snow (either natural or man-made snow or a mixture of them) on the ski slope during thawing periods when the snow normally would melt away.

3,751,936

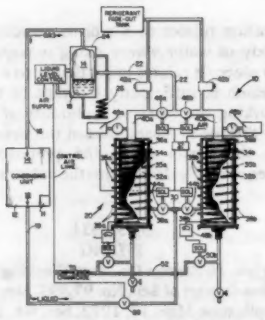
OIL SEPARATOR APPARATUS AND METHOD FOR LOW MISCIBILITY REFRIGERANT SYSTEMS

Joseph R. Simard, 327 Wharf Rd., Pelham, N.H.

Filed Jan. 18, 1972, Ser. No. 218,695

Int. Cl. F25b *43/02*

U.S. Cl. 62—84 **7 Claims**



A process for removing oil contamination from refrigerent in a refrigeration system utilizing an oil lubricated, reciprocating piston type condenser unit. The system is characterized by use of heat-cleanable filter tanks mounted in parallel and forming alternating means for scavenging oil from liquid refrigerant, and heating the oil to cause its flow from the filter tank. A cycle timer initiates the defrost cycle at predetermined intervals, such as weekly.

3,751,937

WARP KNITTING MACHINE HAVING EXHAUSTED SPOOL DETECTOR AND SPOOL THEREFOR

Rudolph G. Bassist, Lancaster, Pa., assignor to Travis Mills Corp., New York, N.Y., a part interest

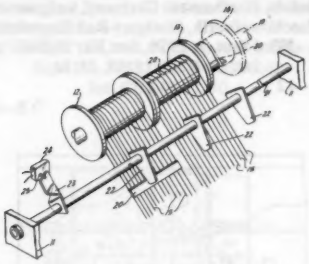
Filed Dec. 13, 1971, Ser. No. 207,494

Int. Cl. D04b *23/00, 27/00*

U.S. Cl. 66—86 A **9 Claims**

The warp beam of a knitting machine carries a spool of yarn from which a plurality of threads extend to the knitting instrumentalities of the machine. A means, such as a strip of tape adhesively secured to the threads, extends transversely across at least two adjacent threads at a point close to the ends of the threads which are first wound on the spool. Sensing means, such as an element arranged between the two threads in the

path of movement of the tape, detects the tape and in response thereto a switch is operated to terminate operation of the



machine. Each spool on the warp beam is furnished with a tape, and a separate sensing means is arranged to detect the tape of each spool.

3,751,938

APPARATUS FOR CONTROLLING LOW-TEMPERATURE INSTALLATIONS

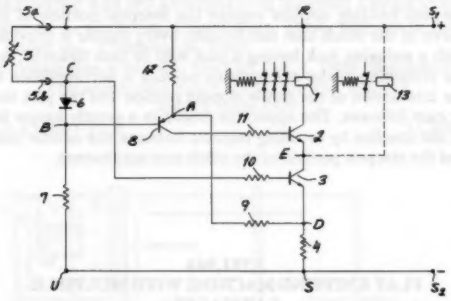
Otto Breitenbach, Mainz-Kostheim, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Feb. 28, 1972, Ser. No. 229,863

Claims priority, application Germany, Feb. 26, 1971, P 21 09 309.4—13

Int. Cl. F25b *49/00*

U.S. Cl. 62—126 **9 Claims**



A system for controlling low-temperature installations, such as refrigeration units for maintaining foods and other perishable items at low temperatures, wherein the cooling system is regulated by a thermostat having a transistor and relay arrangement for preventing cut-off of the cooling unit upon failure of the thermostat circuitry.

3,751,939

WEIGH BAR SWITCH ARRANGEMENT FOR AUTOMATIC ICE MAKER

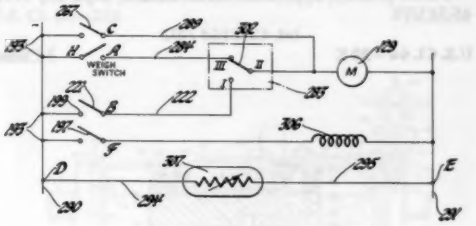
James A. Bright, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 1, 1972, Ser. No. 302,743

Int. Cl. F25c *5/18*

U.S. Cl. 62—137 **4 Claims**

A weigh switch to stop production of an automatic ice maker whenever the ice collecting bin is either filled with ice pieces or removed from its carrier means. An electrically conductive bin weigh bar is pivoted on a terminal post to provide a first lever arm loaded by the carrier means and a second counterbalancing lever arm which pivots the bin weigh bar from a first open circuit position to a second ice maker energizing position electrically contacting an overlying conductive pivoted ice weigh bar when the bin is inserted in the carrier means and the combined weight of the bin and its contents is below a predetermined amount. In response to the weight of a



filled bin, the bin and ice weigh bars are pivoted in unison to a third open circuit position thereby terminating the production of ice pieces.

3,751,940

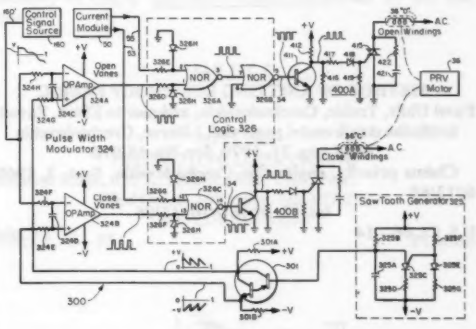
REFRIGERATION SYSTEM PRV MOTOR CONTROL SYSTEM

Dean K. Norbeck, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Sept. 17, 1971, Ser. No. 181,407

Int. Cl. F25b *1/00*

U.S. Cl. 62—217 **4 Claims**

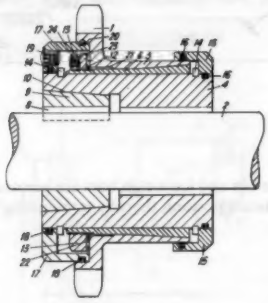


An improved system for automatically energizing from a.c. mains the PRV motor of a refrigeration system over an extensive range of average (long time constant) rates in response to a control signal is disclosed employing a sawtooth wave generator of a frequency two orders of magnitude below the a.c. mains frequency, a d.c. control signal source, a comparator to compare the control signal and the sawtooth signals and produce a d.c. output pulse at the sawtooth frequency of greater or lesser width (0° to 360°) depending on their relationship. A transistor switch is driven from the comparator to operate a Triac for the pulse period and energize from the a.c. mains the windings of the motor. Two comparators are arranged to alternatively produce pulses depending on whether the control signal is above (e.g. +1 to 13v) or below (e.g. −1 to −13v) a desired "deadband" (+1 to −1). One comparator's output energizes "open" motor winding while the others output energizes "close" winding.

3,751,941
TORQUE-LIMITING CLUTCH

Rodney Allen Stiff, Bundaberg, Australia, assignor to Massey-Ferguson (Australia) Limited, Victoria, Australia

Filed Sept. 20, 1971, Ser. No. 181,683
Claims priority, application Great Britain, Sept. 25, 1970, 45,717/70
Int. Cl. F16d 7/02
U.S. Cl. 64—30 E 3 Claims

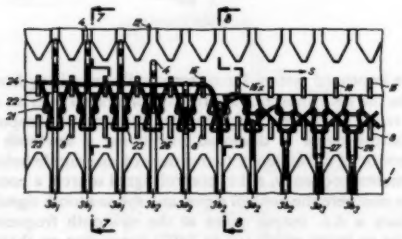


A torque limiting clutch formed of concentric friction members, upon overload, one member slips relative the other, generating heat causing the elements to expand. The outer clutch member expands more rapidly than the inner resulting in a reduction of the frictional forces between the members and a corresponding reduction in torque.

3,751,942
METHOD OF KNITTING RUN-PROOF FABRIC

Pavel Uhlir, Trebic, Czechoslovakia, assignor to Elitex, Zavody textilniho strojirenstvi generalni, Liberec, Czechoslovakia

Filed Aug. 21, 1970, Ser. No. 65,978
Claims priority, application Czechoslovakia, Sept. 3, 1969, 6013/68
Int. Cl. D04b 9/10, 15/06
U.S. Cl. 66—14 1 Claim

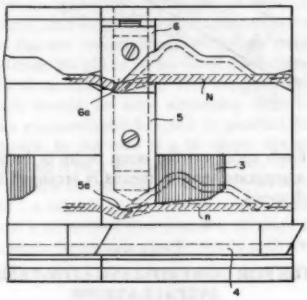


Run-proof courses are formed by providing alternate needles of a circular knitting machine with loops formed of independent yarns and thereafter pulling one of said yarns from said alternate loop and interlooping the pulled yarn through an adjacent loop.

3,751,943
APPARATUS FOR CONTROLLING THE JACKS AND NEEDLES OF CIRCULAR KNITTING MACHINES

Alfred Schindele, Harthausen, Germany, assignor to C. Terrot Sohne, Maschinenfabrik, Stuttgart-Bad Cannstatt, Germany

Filed Sept. 9, 1970, Ser. No. 70,866
Int. Cl. D04b 15/68, 15/32
U.S. Cl. 66—42 3 Claims

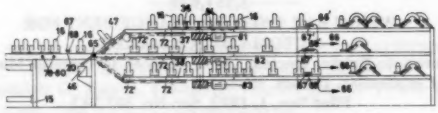


Apparatus for the control of jacks and needles of a circular knitting machine with a needle track. The machine has gradually sloping cam means disposed around the cylinder of the circular knitting machine which position the non-knitting needles, such cam means being so arranged that the needle butt or cam follower is indirectly moved by a gently sloping portion of the cam means, without having the needle butt of the non-knitting needles engage the steepest portion of the curve of the stitch cam mechanism; every needle is provided with a swinging jack having a jack butt or cam follower, and the retracting of the non-knitting needles is accomplished by the interaction of the gently sloping portion and the jack butt or cam follower. The apparatus results in a greatly longer life of the needles by avoiding impacts between the needle butts and the steepest portion of the stitch cam mechanism.

3,751,944
FLAT KNITTING MACHINE WITH MULTIPLE CARRIAGES

Erich Krause, Bopfingen, Germany, assignor to Universal Maschinenfabrik Dr. Rudolf Schieber KG, Westhausen, Germany

No Drawing. Filed June 8, 1971, Ser. No. 151,088
Int. Cl. D04b 7/04
U.S. Cl. 66—64 10 Claims



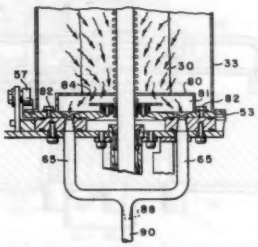
Several flat needle beds of a knitting machine are arranged along a loop-shaped path in which many knitting carriages travel in a continuous row in the same direction. Individual carriages are switched automatically from the path to a holding area and returned from the holding area to the loopshaped path as may be required for producing a desired pattern and for replenishing yarn on the carriage.

3,751,945

APPARATUS FOR BULKING YARN IN PACKAGE FORM

Paul W. Eschenbach, 613 Pinehill Dr.; Jerry N. King, 424 S. Fairview Ave., and Dennis L. Riddle, 1458 E - Dover Rd., all of Spartanburg, S.C.

Division of Ser. No. 181,069, Sept. 16, 1971. This application Sept. 15, 1972, Ser. No. 289,248
Int. Cl. D06c *1/00*
U.S. Cl. 68—5 C 3 Claims



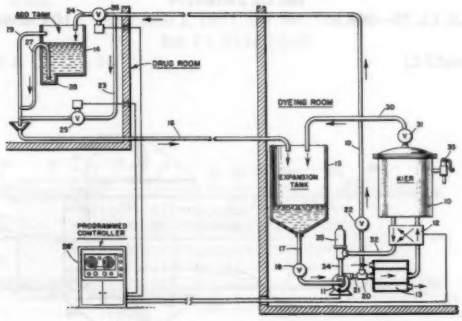
Apparatus to bulk yarn in package form which employs a dome in which is placed the package of yarn to be bulked by a supply of steam supplied from a nozzle which moves up through a plenum chamber to supply the steam to the interior of the dome.

3,751,946

PRESSURE RELIEF SYSTEM FOR DYEING APPARATUS

Jefferson L. Claiborne, Chattanooga, Tenn., assignor to Dixie Yarns, Inc., Chattanooga, Tenn.

Continuation of Ser. No. 764,169, Oct. 1, 1968, abandoned. This application Feb. 1, 1971, Ser. No. 111,614
Int. Cl. B05c *8/02*
U.S. Cl. 68—12 R 3 Claims



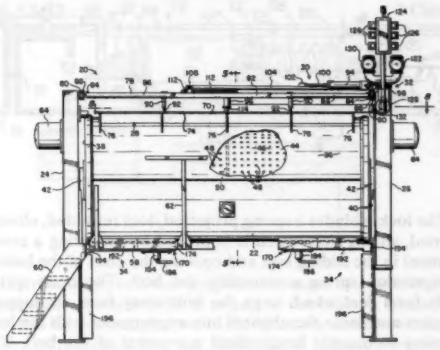
An improved package yarn dyeing system adapted for operation above the boiling point including a dye chemical add tank receiving a predetermined amount of diluting bath liquid before it is siphoned into an expansion tank and fed from there to the pump inlet feeding a kier through a heat exchanger. Further bath dilution and line washing as well are achieved by an add tank bypass line through which bath liquid is circulated. The add tank fill line emanates from the pump outlet and the kier dome is tapped by an additional expansion tank feed line to enhance and speed up dilution uniformity. The part of the equipment for circulating the dye back and forth through the packages may be isolated from the rest of the system and is protected against pressure damage by an expansion chamber containing a small volume of entrapped air.

3,751,947

COMMERCIAL LAUNDRY MACHINE

Alex Toth, Lincolnwood, Ill., assignor to Ellis Corporation, Chicago, Ill.

Filed Aug. 5, 1971, Ser. No. 169,376
Int. Cl. D06f *39/14*
U.S. Cl. 68—210 9 Claims



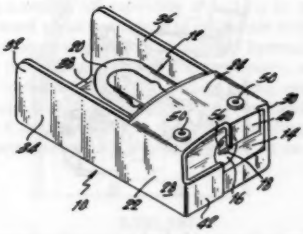
A commercial laundry machine includes two spaced end frames supporting a generally cylindrical washer casing for rotation around its central axis. A casing door supported by the frame is movable to a closed position against the casing during washing operations and to a remote position spaced from the casing for loading and unloading of laundry. Fluid is introduced into the casing through a conduit in the casing door. Fluid from the casing is discharged from discharge valves into discharge conduits on the casing extending laterally to empty into fixed chutes supported by the end frames.

3,751,948

PROTECTIVE LOCK CASING

Sheldon Klein, 333 E. 55th St., New York, N.Y.

Filed Oct. 6, 1971, Ser. No. 187,092
Int. Cl. E05b *67/04*
U.S. Cl. 70—55 2 Claims



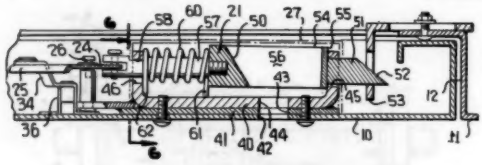
A protective casing for a lock having a body provided with a barrel and a shackle. The casing includes a sheath for surrounding the lock and for surrounding the shackle on three sides, so as to prevent access of cutters, snippers, and the like for breaking the shackle. Suitable flanges are provided on the sheath for protecting against unauthorized removal of the barrel. The lock is fixed to the sheath.

3,751,949

LOCKING DEVICE

Alfred B. Castle, 4104 Maryland Ave., Washington, D.C.

Filed Oct. 1, 1971, Ser. No. 185,575
Int. Cl. E05c 1/12
U.S. Cl. 70—144 9 Claims



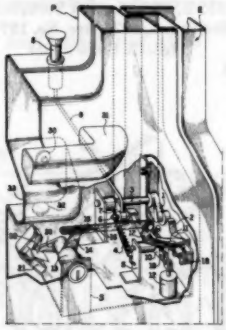
The lock includes a spring projected, tool retracted, closure carried, sliding bolt which is improved by providing a cross-channel in the sliding bolt and opening the ends of the helical compression spring surrounding the bolt. The open spring ends form feet which urge the bolt away from its support bracket and force the channel into engagement with the lock housing to prevent longitudinal movement of the bolt. The lock is also arranged to actuate a pivot arm which controls the sliding movement of two secondary bolts to provide a three-point locking device.

3,751,950

DEVICE SIMULTANEOUSLY CONTROLLING THE LOCKING AND RELEASE OF A PLURALITY OF DOORS

Andre Leger, Sartrouville, and Gerard Mauron, Versailles, both of France, assignors to Automobiles Peugeot, Paris, and Regie Nationale Des Usines Renault, Billancourt, both of France

Filed Nov. 8, 1971, Ser. No. 196,410
Claims priority, application France, Nov. 30, 1970, 7043001
Int. Cl. E05b 65/36
U.S. Cl. 70—264 2 Claims



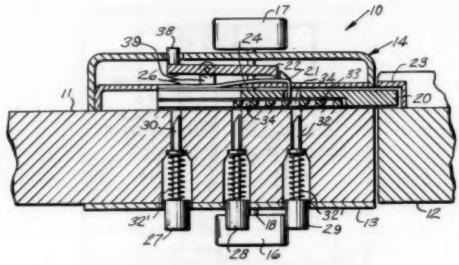
Device for simultaneously locking or releasing a plurality of doors of a vehicle. Each door has an electrical latch and each electromagnet for withdrawing the bolt of the latch is connected to a source of voltage through a common switch. The latter is connected in series with the electromagnets and actuatable by a first coil which is connected to the source through at least one switch in series for locking the doors. The common switch is also actuatable by a second coil connected to the source through at least one switch in series for releasing the doors.

3,751,951

PUSH-BUTTON DOOR LOCK

James Robert Gridley, St. Andrews Rd. R.D. No. 1, Walden, N.Y.

Filed Mar. 10, 1972, Ser. No. 188,665
Int. Cl. E05b 37/16
U.S. Cl. 70—313 6 Claims



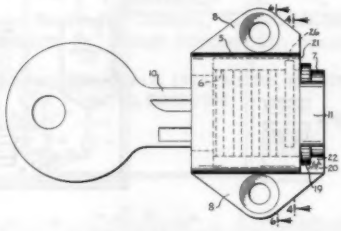
A lock device consisting primarily of three push-buttons with a projection for resetting the lock, and another button on the inside of the door that serves to release the lock with one punch.

3,751,952

COMPACT CYLINDER LOCK

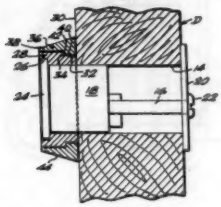
Hugo G. Rubner, Milwaukee, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Dec. 27, 1971, Ser. No. 212,559
Int. Cl. F05b 9/04
U.S. Cl. 70—368 10 Claims



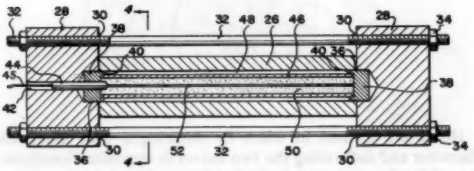
A lock cylinder is confined against forward displacement out of a body in which it rotates by a circumferential land near its rear end, overlying the rear face of the body. Overlying the rear face of the land, a hook-shaped lug on the body prevents rearward cylinder displacement. In an assembling position of rotation the cylinder is insertable forwardly into the body because a discontinuity in the land allows it to pass the lug. The cylinder is normally confined against rotation to said assembling position by stop means comprising a stop member similar to a plate tumbler, but not key actuated, engageable with an abutment inside the body defined by a tumbler groove.

3,751,953
PROTECTIVE LOCK RING ASSEMBLY
George Newman, 2010 N.E. 120 Rd., North Miami, Fla.
Filed Feb. 22, 1972, Ser. No. 227,890
Int. Cl. E05b *15/02*
U.S. Cl. 70—381 4 Claims



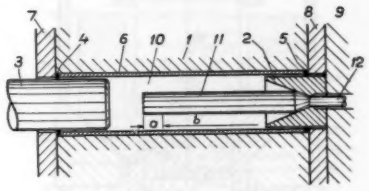
A two-part lock ring assembly for protectively encircling the outwardly projecting portion of a cylinder type of door lock. The ring assembly is comprised of an inner ring which is clamped tightly between an outer flange of the lock cylinder and the door, and an outer ring which is loosely, rotatively, held about the inner ring. The outer annular ring is of a truncated conical configuration.

3,751,954
METHOD AND APPARATUS FOR EXPLOSIVE AUTOFRETTAGE
Arthur A. Ezra, Littleton; William G. Howell; Herbert S. Glick, both of Denver, and Michael A. Kaplan, Littleton, all of Colo., assignors to Denver Research Institute, Denver, Colo.
Filed June 1, 1971, Ser. No. 148,487
Int. Cl. B21d *26/08*
U.S. Cl. 72—56 12 Claims



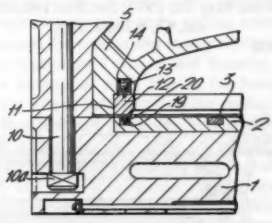
A method and apparatus for producing residual compressive hoop stress at the inner bore of thick-walled tubes by the use of explosive charges positioned along the axis of said tubes. The explosive charge may be placed by itself along the axis of the thick-walled tube or may be enclosed in a second inner tube placed inside the thick-walled tube with an energy transmitting medium filling the space between the two tubes. The explosive charge is detonated producing pressure which plastically expands the thick-walled tube and causes residual compressive hoop stress to be developed at the inner bore upon dissipation of the pressure and elastic contraction of the thick-walled tube.

3,751,955
METHOD OF PREVENTING COMPLETE EXTRUSION OF A BILLET DURING HYDROSTATIC EXTRUSION
Ingemar Stromblad, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden
Filed Feb. 16, 1972, Ser. No. 226,719
Claims priority, application Sweden, Mar. 30, 1971, 4087/71
Int. Cl. B21c *31/00*
U.S. Cl. 72—60 3 Claims



In order to prevent the complete extrusion of a billet during hydrostatic extrusion, the rear end of the billet is treated so that it is harder than the rest of the billet. As a result, when the rear end reaches a die, the resistance to extrusion increases and can be detected so that extrusion can be stopped.

3,751,956
FLUID-DYNAMIC PRESS FOR THE COLD FORMING OF SHEET METAL
Turreno Blanchi, Terni, Italy, assignor to S.A.I.P. (S.p.A.), Terni, Italy
Filed Sept. 27, 1971, Ser. No. 184,062
Int. Cl. B21d *26/02*
U.S. Cl. 72—57 5 Claims

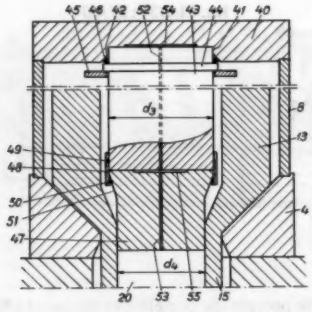


A fluid-dynamic press, in particular a hydraulic press, for the cold forming of sheet metal of thin thickness wherein the pressure application means acts directly upon the work piece, comprising a means for providing a packing on the pressure side of the work piece positioned to cooperate with an annular holding plate associated with a plurality of hydraulic clamping pistons on the opposite side of the workpiece, said holding plate and hydraulic clamping pistons being mounted in a removable die body mounted in the press and an integral part of the die. Consequently, the workpiece holding means and sealing means are specifically designed to fit each die body employed.

3,751,957
PRESS FOR HYDROSTATIC EXTRUSION OF TUBES
Jan Nilsson, Robertsfors, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden
Filed Feb. 10, 1972, Ser. No. 225,073
Claims priority, application Sweden, Mar. 15, 1971, 3277/71
Int. Cl. B21c *25/04*
U.S. Cl. 72—60 11 Claims

A press for hydrostatic extrusion of tubes has a pressure chamber containing a pressure generating fluid and a spacer

element arranged in the cylinder with a mandrel axially fixed at its inner end by the spacer tube. The mandrel has a point part cooperating with the die in the cylinder. This point part of the die has a smaller cross-section than the rear part of the die, which rear part is secured to a support from which it is



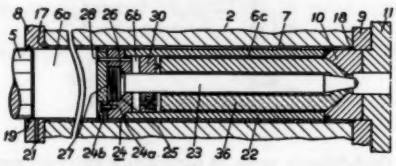
separate. The joint between the support and the inner end of the die is sealed. The pressure exerted by the pressure fluid on the larger part of the mandrel in a direction away from the die is greater than the frictional force between the billet being extruded and the point of the mandrel.

3,751,958

PRESS FOR HYDROSTATIC EXTRUSION OF TUBES

Jan Nilsson, and Hans Larker, both of Robertsfors, Sweden, assignors to Allmanna Svenska Electriska Aktiebolaget, Vasteras, Sweden

Filed May 20, 1971, Ser. No. 145,184
Int. Cl. B21c *25/04*
U.S. Cl. 72—60 **10 Claims**



A press for hydrostatic extrusion of tubes includes a press stand with a pressure cylinder movable therein to engage over a die supported by the press stand, and a pressure-generating punch movable in the other end of the cylinder. A sleeve slidable in the cylinder supports a mandrel which can engage through an annular billet into the die opening. A billet holder is slidable in the sleeve, the mandrel passing through it. The billet holder is so constructed that pressure fluid can pass from one side of it to the other.

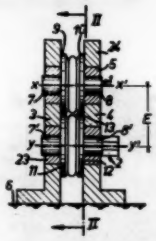
3,751,959

FORGING MACHINE

Gaston C. Ory, 7, rue des Jardies, Meudon, Hauts-de-Seine, France

Filed July 19, 1971, Ser. No. 163,747
Claims priority, application France, July 24, 1970, 7027515
Int. Cl. B21b *31/20*
U.S. Cl. 72—237 **2 Claims**

Machine for forging a bar between two rolls, each roll having a single constraint groove located between two flanges destined to turn between said corresponding bearings, each flange on one side of the groove turning while being in contact with the corresponding flange of the other roll situated on the



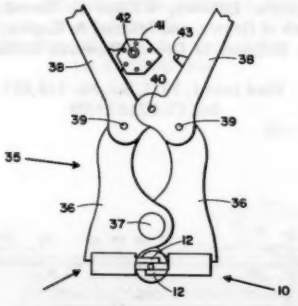
same side of the groove, said housings being oriented so that the entry axes of the roll journals are perpendicular with each other.

3,751,960

WIRE PIERCING METHOD AND APPARATUS

Arthur Francis Morton, St. Hubert, Quebec; Francois Belanger, and William Anhang, both of Montreal, Quebec, all of Canada, assignors to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Oct. 7, 1971, Ser. No. 187,293
Int. Cl. B21d *31/02*
U.S. Cl. 72—326 **5 Claims**



Holes are formed in wires by shearing a wire along its diameter and deforming the two halves in opposite directions. A tool for forming such holes has two opposed cutting edges and an abutment surface associated with each cutting edge. Relative movement of the cutting edges, in a shearing action, slits the wire and the abutment surfaces push the wire halves in opposite directions to form a hole -which can be larger in diameter than the diameter of the wire.

3,751,961

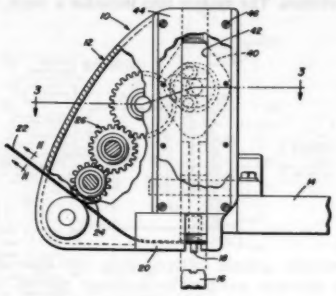
STAPLING MACHINE FOR MAKING ELECTRICAL CONNECTIONS AND OTHER FASTENINGS

Arthur Graf, 323 W. 43rd St., New York, N.Y.

Filed Dec. 24, 1970, Ser. No. 101,246
Int. Cl. B21d *28/00*
U.S. Cl. 72—339 **7 Claims**

Metal stock sequentially cut, folded and clinched about a pair of electrical leads in a stapling machine into which the

stock is fed. A pair of relatively movable, metal deforming elements are advanced along a track by link connections to a



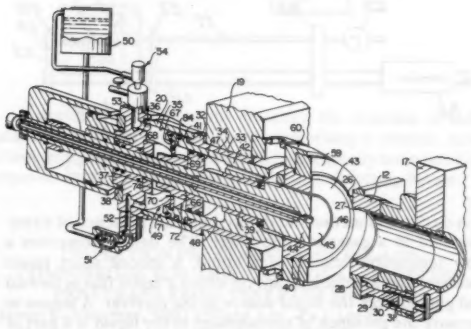
common crank pin rotated by a drive shaft during each cycle to perform the metal deforming operations with sufficient impact.

3,751,962

METHOD AND APPARATUS FOR MAKING A DRAWN ARTICLE

Daniel S. Cvacho, and Joseph W. Wallace, both of Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Nov. 6, 1970, Ser. No. 87,460
Int. Cl. B21d *26/14*
U.S. Cl. 72—347 **30 Claims**



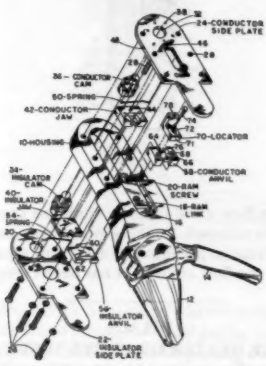
An apparatus for drawing an article from a blank of material disposed between cooperating draw members and being drawn therefrom by a movable ram moving relative to the draw members and having a fluid chamber receiving piston portions of one of the draw members and the ram whereby relative movement between the apparatus and the one draw member in one direction causes the blank drawing movement of the ram by the fluid action between the piston portions in the chamber. Restriction means are provided in the chamber for restricting fluid flow between the piston portions at least during the initial part of the drawing operation of said ram on said blank so that a back pressure is created on the one draw member to maintain sufficient holding force on the blank being drawn therefrom to prevent adverse wrinkles on the article being drawn.

3,751,963

CONTACT CRIMPING TOOL EMPLOYING INDIVIDUAL INSULATION AND WIRE CRIMP ADJUSTMENTS PLUS LIGHTWEIGHT HOUSING HAVING SIDE ARMS AND OPPOSED PLATES

Kenneth Munshower, Norristown, and James R. Smoyer, Elkins Park, both of Pa., assignors to Elco Corporation, Willow Grove, Pa.

Filed June 3, 9171, Ser. No. 149,598
Int. Cl. B21d *9/08*
U.S. Cl. 72—410 **10 Claims**



A manual tool for attaching an electrical contact having two pairs of tabs on the tail thereof to a wire having a stripped end; the tool simultaneously crimps one pair of tabs around the conductor of said wire and the other pair around the insulation sleeve of said wire. The tool comprises a pair of handles and an attached housing containing two pairs of crimp dies (each pair comprising an anvil and a mating crimp jaw) and a linkage mechanism for converting rotary motion of said handles into linear motion of a ram in said housing. A contact is inserted into a locator or nest, also in the housing, and the stripped end of a wire is held between the contact tabs. As the handles are closed, the ram pushes the anvils toward the crimp jaws; the jaws crimp the two pairs of tabs of the contact around the conductor and insulation sleeve, respectively, of the wire. Since one anvil is coupled loosely to the locator, the locator brings the contact up with the anvils. When the tool is opened, the locator returns with the anvils, but is prevented from complete travel—and thus is stopped in a "ready" position—by a pin boss on the locator which engages a ledge on one of the side plates attached to the housing. The "insulator" and "conductor" jaws are spring-urged against respective multi-sided cams which can adjust each jaw's position to provide optimum crimping in accordance with the respective sizes of the conductor and insulator. The cams are rotatably mounted together and to the side plates such that the crimp force is transmitted to the side plates and then, by means of link pins, to the housing. The ram comprises an adjustable bolt having a polygonal head which is locked against rotation by the side plates.

3,751,964

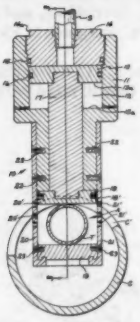
DEVICE FOR FORMING A FLOW RESTRICTION IN A FLOW CONDUCTOR

Kermit G. Rowley, Houston, Tex., assignor to Tenneco Oil Company, Houston, Tex.

Filed Sept. 21, 1970, Ser. No. 73,849
Int. Cl. B21d *17/00*
U.S. Cl. 72—470 **4 Claims**

An hydraulically powered piston moves two curved dies toward each other to crimp a flow conductor positioned between the dies. Travel of the piston is limited to prevent complete crimping of the conductor and the structure holding

the two dies for relative movement with respect to each other may be disassembled and reassembled for positioning about an axially extending flow conductor. The external curvature of the die surfaces is not substantially greater than the external



curvature of the flow conductor to minimize cracking in the conductor as it is crimped. Locking means may be included in the crimping device to prevent the dies from separating from each other after the flow conductor has been crimped.

3,751,965

RESISTANCE HEATER GRAPHITE TEST CAPSULE

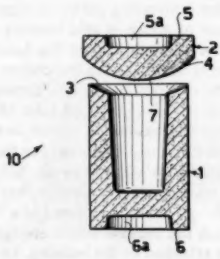
Thaddaus Kraus, Furstentum, Liechtenstein, assignor to Balzers Patent und Beteiligungs Aktiengesellschaft, Balzers, Furstentum, Liechtenstein

Filed July 6, 1971, Ser. No. 159,837

Claims priority, application Switzerland, July 15, 1970, 10790/70

Int. Cl. G01n *7/00*

U.S. Cl. 73—19 **2 Claims**



A test capsule of a graphite material which includes a cylindrical bottom part and a cover which is engageable over the bottom part and which includes either a spherical engagement surface which is engageable with a partially spherical engagement surface of the bottom part or a conical surface of the bottom part. The cover and the bottom part are provided with ring-shaped ends which are engageable by electrodes for supplying current therethrough for resistance heating thereof in order to heat the sample within the cylindrical bottom part container.

3,751,966

PROCESS CONTROL

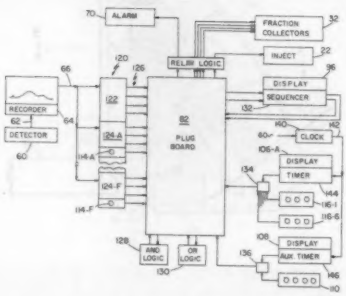
James M. Ryan, Weston, and Carl Richardson, Bedford, both of Mass., assignors to Abcor, Inc., Cambridge, Mass.

Continuation of Ser. No. 711,063, March 6, 1968, abandoned. This application Nov. 8, 1971, Ser. No. 196,845

Int. Cl. G01n *31/08;* **B01d** *15/08;* **G06f** *15/20*

U.S. Cl. 73—23.1 **8 Claims**

A gas chromatographic system includes a chromatographic column, injection control and six fraction collectors. A thermal conductivity detector monitors the outlet conduit of the column and controls a strip chart recorder which includes a retransmitting potentiometer. Connected to the potentiometer are a peak-valley-slope signal generator and six set point signal generators. The system also includes a clock, six time



comparators, an auxiliary timer and a twenty step decatron sequencer. A plug board permits selective interconnection of the signal generators, the time comparators, the timer and the sequencer for producing output signals to operate the injection control and the fraction collectors as a function of the output of the column as monitored by the detector.

3,751,967

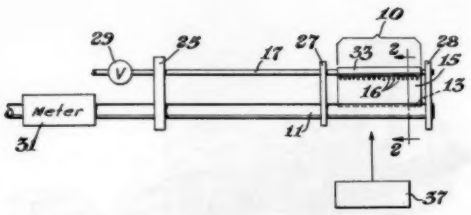
SAMPLING DEVICE

Robert L. Fick, and Allen H. Markey, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 14, 1970, Ser. No. 97,848

Int. Cl. G01n *31/00*

U.S. Cl. 73—23 **11 Claims**



A device and method for determining the presence of a contaminant in a gaseous atmosphere. The device comprises a flow regulatable source of a liquid, a spaced apart liquid receiver, and a surface means on which a liquid film is formed and guided from the liquid source to the receiver. A means to measure the presence of contaminant in the liquid is a part of the device. The device is especially useful for determining the presence of a chemically active pollutant in a gaseous phase.

3,751,968

SOLID STATE SENSOR

Jack C. Loh, Liverpool, and Chih-shun Lu, Jamesville, both of N.Y., assignors to Inficon Inc., East Syracuse, N.Y.

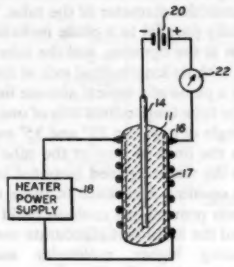
Filed Jan. 22, 1971, Ser. No. 108,796

Int. Cl. G01n *31/04, 31/06*

U.S. Cl. 73—23 **19 Claims**

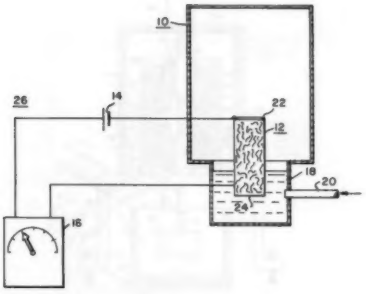
A sensor for detecting given constituents of an atmosphere employing a solid state device formed by a glass-ceramic element having a depletion layer exposed to the atmosphere in which a given gas or vapor is to be sensed. The glass-ceramic sensor is formed with two terminals on opposite sides of the depletion layer and the terminals are connected into a circuit establishing a potential difference between the terminals

across the depletion layer. By forming the glass-ceramic element of a material in which leakage currents between the ter-



minals through the glass-ceramic sensing element will be produced by the presence of a given material in the atmosphere, sensing results.

3,751,969
DETECTION SYSTEM
Steven L. Schrock, Madison, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Aug. 17, 1970, Ser. No. 64,360
Int. Cl. G01n *27/00*
U.S. Cl. 73—23 **7 Claims**

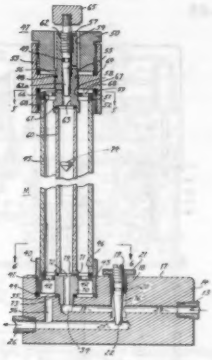


A detector is disclosed for detecting the presence of substances that form ions in liquids, comprising a porous, nonconducting wicking material which is electrically connected to a power supply and a current or resistance detecting device.

3,751,970
INSPECTION PENETRANT PROCESS AND COMPOSITION FOR AIDING REMOVAL OF EXCESS PENETRANT FROM TEST PART SURFACES
James R. Alburger, 5007 Hillard Ave., La Canada, Calif.
Continuation-in-part of Ser. No. 804,200, March 4, 1969, which is a continuation-in-part of Ser. No. 787,381, Dec. 27, 1968, and a continuation-in-part of Ser. No. 675,896, Oct. 17, 1967, Pat. No. 3,429,826, which is a continuation-in-part of Ser. No. 497,058, Oct. 18, 1965, Pat. No. 3,349,041. This application Feb. 9, 1972, Ser. No. 224,656
Int. Cl. G01m *3/20*; G01n *21/16, 21/38*
U.S. Cl. 73—36 **6 Claims**

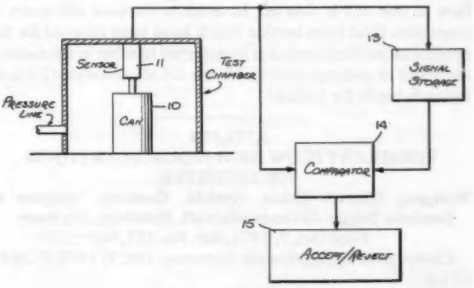
Oil and/or water compatible gel or emulsion forming compositions are disclosed for use in treating test parts in an inspection penetrant process. Following treatment of test parts such as, for example, jet engine turbine buckets, with a fluorescent penetrant, it is desired to remove excess penetrant from the surface of said test parts without leaving smears and spots of blotchy fluorescent residues thereon. Such removal may be accomplished effectively using a composition comprising, for example, dimethyl formamide, methylene chloride, mineral thinner and ethylene glycol monobutyl ether.

3,751,971
AIR GAGING DEVICE
John C. Wilcox, c/o P. A. Patterson Co., Inc., 2201 Ardmore Ave., Drexel Hill, Pa.
Filed Oct. 20, 1971, Ser. No. 190,798
Int. Cl. G01m *3/02*
U.S. Cl. 73—37.9 **5 Claims**



An air gaging device is provided wherein a regulated flow of air is provided to and through a visual gaging device, which includes a transparent hollow tube supporting a rotormeter tube and providing a pathway for air flow to a workpiece whose dimensions are to be measured.

3,751,972
LEAK DETECTOR FOR SEALED CONTAINERS
Hyman Hass, Stamford, Conn., assignor to Applied Fluidics Inc., Westbury, N.Y.
Filed Aug. 2, 1972, Ser. No. 277,481
Int. Cl. G01m *3/04*
U.S. Cl. 73—45.4 **9 Claims**

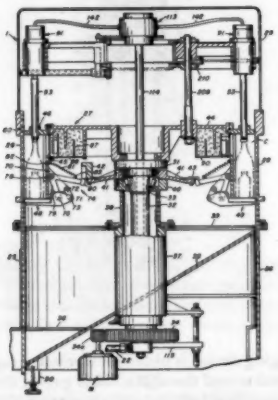


A leak detector for testing sealed containers formed of semi-rigid or flexible material. The container to be tested is placed in a chamber which is thereafter pressurized at a pressure distinctly different from the internal container pressure, whereby the container is caused to physically distort. A container dimension is first sensed before the chamber is pressurized to produce a first signal representing the dimension resulting from the difference between internal pressure and atmospheric pressure, this first signal being held. When the container is under pressure in the chamber and a predetermined time interval has elapsed, the container dimension is again sensed to produce a second signal representing the dimension as a result of the difference between internal pressure and chamber pressure. The held first signal and the second signal are compared and if the disparity therebetween indicates a significant change in dimension, the container is accepted, whereas if there is little disparity between signals, the container is rejected.

3,751,973
APPARATUS AND METHOD FOR PRESSURE TESTING CONTAINERS

Leo Strauss, East Rockaway, N.Y., and Gerard J. Voytek, Bridgeport, Conn., assignors to Glass Containers Corporation, Fullerton, Calif.

Filed Feb. 8, 1971, Ser. No. 113,425
Int. Cl. G01m 3/02
U.S. Cl. 73—45 31 Claims

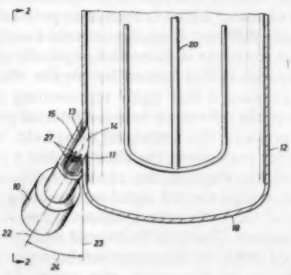


An apparatus and method for pressure testing of bottles wherein each bottle is subjected to a charge of pressurized fluid while being enclosed within individual peripheral cells of a rotating turret. Each cell is constructed such that the cell interior is sealed during testing while failure of a bottle to withstand a predetermined internal pressure, resulting in breakage of the bottle, effects immediate discharge of the broken bottle from the cell. The pressurized fluid, such as air, which is charged to the bottles during testing, is controlled by a central fluid distribution system with individual filling heads provided for each cell. Upon breakage of a bottle, the fluid flow to that cell is shut off. In order to increase efficiency of operation, fluid from bottles which have been charged for the predetermined test period is transferred to other bottles which are about to undergo testing. Means are also provided for testing each bottle for leakage.

3,751,974
TURBULENT FLOW HIGH-MOLECULAR LIQUID VISCOSIMETER

Wolfgang Dietrich Urbas, Krefeld, Germany, assignor to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Filed Oct. 7, 1971, Ser. No. 187,343
Claims priority, application Germany, Oct. 9, 1970, P 20 49 672.4
Int. Cl. G01n 11/10
U.S. Cl. 73—54 21 Claims

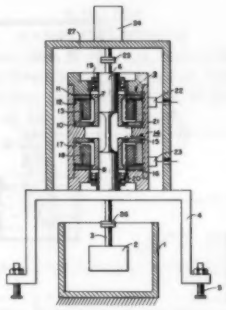


A device for continuously measuring the viscosity of high-molecular liquids in turbulent flow comprises a vibrating reed on a viscosimeter mounted in a tube opening into an agitating cylindrical vessel with the free end of the vibrating reed pointing upstream and positioned a distance from the flowing liquid equal to three times the diameter of the tube. The face of the reed is substantially parallel to a plane including a typical arcuate line of flow at the opening, and the tube containing the reed is mounted with its longitudinal axis at an angle between 5° and 15° below a plane of a typical arcuate line of flow at the tube opening. The tube longitudinal axis of one embodiment is mounted at an angle of between 25° and 35° outwardly from a plane tangent to the lines of flow at the tube opening and a modification has the vibrating reed mounted in two tubes and spaced from the opening a distance of three tube diameters. Both embodiments prevent gas cushion build up around the vibrating reed and the attendant inaccurate measurement in a reaction producing higher molecular materials under azeotrope-forming conditions.

3,751,975
TORSION DIGITAL VISCOMETER

Takeshi Katsura, Tokyo, Japan, assignor to Ono Sokki Co., Ltd., Tokyo, Japan

Filed Aug. 12, 1971, Ser. No. 171,139
Claims priority, application Japan, Sept. 1, 1970, 45/76902
Int. Cl. G01n 11/10
U.S. Cl. 73—59 6 Claims



A rotary type viscometer having a torsion bar mounted in driving relationship with the rotor and a digital detector is mounted to the rotor. The torsion bar includes spaced coaxially supported magnetic cylinders each having a toothed external surface cooperatively arranged in spaced relationship with a pair of toothed magnetic ring members of a pair of magnetic pickups. The torsion bar and magnetic ring members are each supported for at least limited rotation. The change in phase difference of a reference phase difference is detected in the outputs of the magnetic pickup in response to the turning torque on the torsion bar.

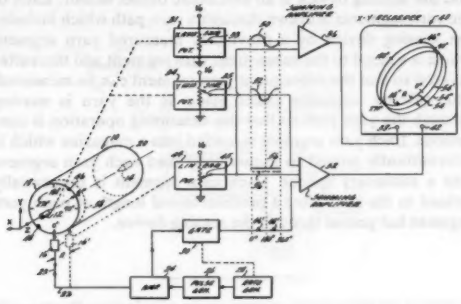
3,751,976
ULTRASONIC INSPECTION SYSTEM WITH PSEUDO-ISOMETRIC DISPLAY

Victor Eugene Pike, Cincinnati, Ohio, assignor to General Electric Company, Lynn, Mass.

Filed July 24, 1972, Ser. No. 274,174
Int. Cl. G01n 29/04
U.S. Cl. 73—67.9 6 Claims

In an ultrasonic inspection system for bodies of circular cross-section, an ultrasonic beam makes a plurality of circumferential scans around the body at spaced apart locations along the length thereof, such that each consecutive circumferential scan is individually displayed as a Lissajous figure offset from a Lissajous figure of a preceding scan. The overall display effect is therefore pseudo-isometric, and defects

within the body are displayed as local pulse distortions along the Lissajous figures.



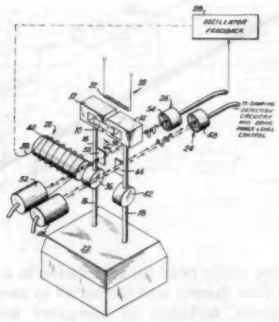
The invention herein described was made in the course of or under a contract or subcontract thereunder (or grant) with the Department of the Air Force.

3,751,977

MATERIAL ANALYZING APPARATUS

Robert G. Schilling, Jr., Flushing, N.Y., assignor to Chemical Instruments Corporation, Bayside, N.Y.

Filed Apr. 19, 1972, Ser. No. 245,574
Int. Cl. G01n *3/32*
U.S. Cl. 73—101 **11 Claims**



An analyzing structure for determining properties such as elastic shear modulus and mechanical hysteresis of a material. A pair of mutually spaced holders hold the sample in such a way that the holders are interconnected by the sample, and these holders are in turn carried by driver and driven supports. A drive sets the driver support into vibratory motion so that the latter is transmitted through the sample to the driven support. By detecting the manner in which the driver and driven supports vibrate it is possible to determine properties of the sample. The sample is tested by cyclically generating substantially pure shear forces in the sample, with the power required to sustain the vibrations of the sample at a constant level being measured to determine the damping of the sample and the frequency of vibration being measured to determine the modulus of the sample.

3,751,978

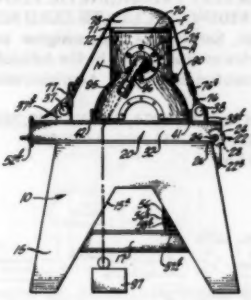
VEHICLE MOTOR BLOCK TESTER AND METHOD OF USING THE SAME

Charles Kenneth Crawford, 503 E. Eight St., Tyler, Tex.

Filed Sept. 30, 1971, Ser. No. 185,310
Int. Cl. G01m *3/06*
U.S. Cl. 73—49.7 **16 Claims**

Apparatus for supporting a motor block in a position for applying fluid pressure thereto for testing the block for leaks in the water courses defined by the block, by supplying fluid under pressure through an adaptor connected to the water pump opening of the block. The block is mounted on a frame which permits tilting for inspection of the underside of the block. Hydraulic or electric lifts may be utilized for moving the frame. The frame has means for securely clamping the block being tested in place thereon.

A method of testing a motor block for leaks, including the steps of supplying a fluid under pressure into the water course



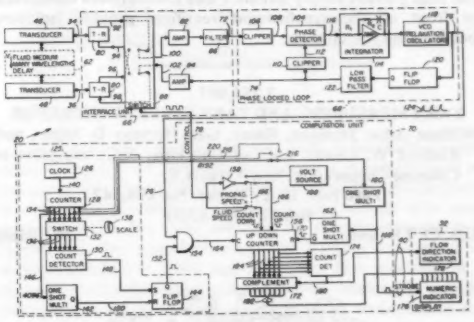
passages of the block. A low viscosity fluid having a coloring material may be used, such as naptha, or ethylene glycol or the like. The fluid is supplied under pressure through the water pump opening of the block and leaks are disclosed by the escape of the fluid through cracks, openings, pin holes, or the like in the block communicating with the water courses therein.

3,751,979

SPEED MEASUREMENT SYSTEM

John Robert Ims, Portsmouth, R.I., assignor to Raytheon Company, Lexington, Mass.

Filed Nov. 17, 1971, Ser. No. 199,486
Int. Cl. G01p *5/00*; G01c *21/10*
U.S. Cl. 73—194 A **12 Claims**



A speed measurement system utilizing a plurality of radiators coupled to a medium for transmitting radiant energy signals within the medium between the radiators in a manner wherein the frequency of the radiant energy is adjusted to retain a predetermined number of wavelengths between a transmitting radiator and a receiving radiator independently of the speed of the medium relative to the radiators. In one embodiment of the invention sonic signals are transmitted through a fluid medium which is moving relative to the radiators. A phase locked loop is interconnected between a pair of radiators by means of a switching arrangement which permits alternative transmissions of sonic energy in the direction of fluid movement (downstream) and in the direction opposite to the fluid movement (upstream). Phase lock is obtained when the frequency of the phase locked loop is such that the

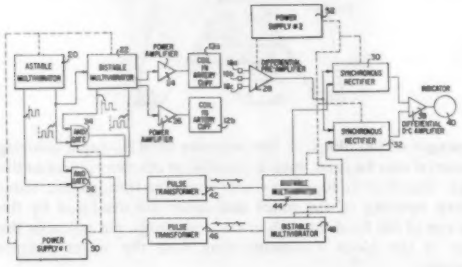
predetermined number of wavelengths of the sonic transmission is present. The speed of the fluid medium as well as the speed of sound propagation within the fluid medium are obtained by arithmetic combinations of the values of the upstream and downstream frequencies.

3,751,980

LOW POWER ELECTROMAGNETIC FLOWMETER PROVIDING ACCURATE ZERO SET

Thomas B. Fryer, Saratoga, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 12, 1971, Ser. No. 198,289
Int. Cl. G01f *1/00*; A61b *5/02*
U.S. Cl. 73—194 EM **9 Claims**



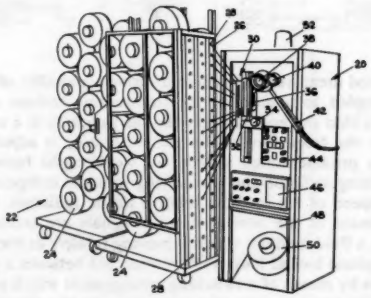
A low power, small size electromagnetic flowmeter system is provided which produces a zero output signal for zero flow. The system comprises an air core type electromagnetic flow transducer, a field current supply circuit for the transducer coils and a pre-amplifier and demodulation circuit connected to the output of the transducer. To prevent spurious signals at zero flow, separate, isolated power supplies are provided for the two circuits. The demodulator includes a pair of synchronous rectifiers which are controlled by signals from the field current supply circuit. Pulse transformers connected in front of the synchronous rectifiers provide isolation between the two circuits.

3,751,981

YARN MEASURING AND YARN FEEDING THEREFOR

William Allen Jernigan, Rome, Ga.; Herman D. Mims, and Raeford W. Clontz, both of Charlotte, N.C., assignors to Celanese Corporation, New York, N.Y.

Filed Nov. 15, 1971, Ser. No. 198,542
Int. Cl. B65h *43/04*
U.S. Cl. 73—160 **30 Claims**



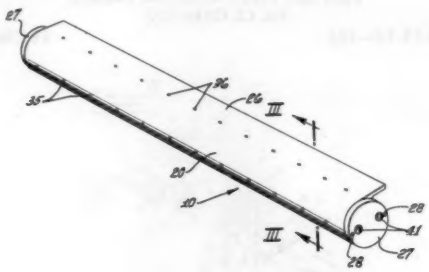
An apparatus and method for sequentially feeding a plurality of individual yarn segments to a sensing device wherein a property of the yarn segments is measured. In a preferred embodiment of the invention, the denier of the yarn is measured and the sensing device is an electronic denier sensor. Each of the yarn segments is drawn through a yarn path which includes the sensing device by a previously measured yarn segment which is spliced to the subsequent yarn segment and thereafter severed so that the subsequent yarn segment can be measured. The splicing operation takes place as the yarn is moving through the yarn path so that the measuring operation is continuous. Each yarn segment is loaded into a magazine which is intermittently moved to sequentially feed each yarn segment into a stationary splicer. Each yarn segment is sequentially spliced to the next after a predetermined length of each yarn segment has passed through the sensing device.

3,751,982

FLUID FLOW METER HEAD AND SYSTEM USING SAME

Robert R. Lambert, 442 W. Leadora, Glendora, Calif.

Filed May 3, 1971, Ser. No. 139,520
Int. Cl. G01p *5/16*
U.S. Cl. 73—212 **7 Claims**



The fluid flow meter head for installation in a duct to measure the fluid flow therein and thereafter to control the fluid flow rate therein, includes an elongated hollow tubular member mounted in the flow of fliud in the duct, said member having spaced walls extending rearwardly therefrom to create a low pressure spaced therebetween, a central wall therein dividing the hollow member into two separate chambers, a series of axially spaced openings in the member facing the flow of fliud and opening into one of the chambers to provide a total pressure sensing chamber, a series of spaced openings in the member facing across the flow of fluid and opening to the second chamber to provide a static pressure sensing chamber, and fluid connecting means from each chamber to a means for measuring differential pressure to provide an indication of the air flow and to control the air flow rate.

3,751,983

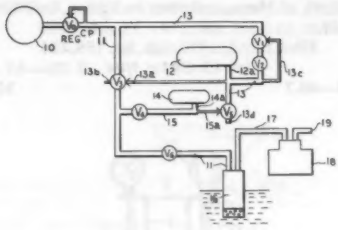
LIQUID SAMPLING

Michael D. Rutkowski, Phoenixville, and Richard R. Thompson, West Chester, both of Pa., assignors to Pro-Tech, Inc., Malvern, Pa.

Continuation-in-part of Ser. No. 214,822, Jan. 4, 1972. This application Mar. 23, 1972, Ser. No. 237,400
Int. Cl. G01n *1/14*
U.S. Cl. 73—421 B **6 Claims**

Samples are taken from a body of liquid at intervals by converting continuous flow of fluid from a pressurized source into intermittent sample-propelling flow. Both the repetition

frequency of sampling and the duration of individual samplings are controlled through regulation of the propellant



flow rate. Principal uses are in stream monitoring for pollution control, sewage treatment facilities, and industrial waste reduction programs.

3,751,984

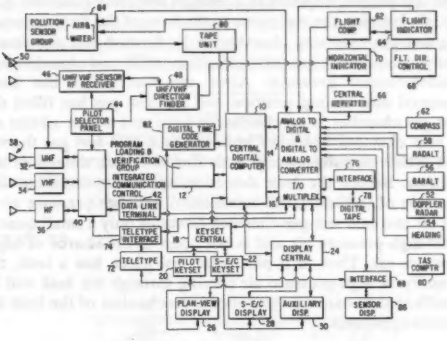
COORDINATED PRECISE POSITION POLLUTION DETECTING

John Coyne Rennie, 33 3rd Ave., Bedford, Mass.

Filed June 5, 1970, Ser. No. 43,723

Int. Cl. G01n *1/00*

U.S. Cl. 73—421 R **4 Claims**



An aircraft is precisely guided in point to point flight while collecting pollutant data from large bodies of water or air. Environmental pollutant data is recorded concurrently wtih aircraft positional data to provide an exact pollution profile for determining source, type and point to point levels.

3,751,985

SAMPLE DIVIDER FOR A LIQUID BEING EXAMINED

Maximilian Knedel, Munich-Grunwald; Hans Krech, Melsungen; Dietrich Ockert, Obermelsungen; Philipp Schipper, Erlangen; Werner Haas, Uttenreuth, and Klaus-Steffen Isensee, Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Erlangen, Germany

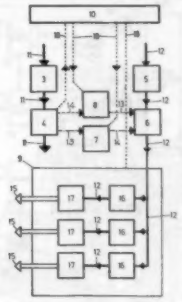
Filed Apr. 27, 1971, Ser. No. 137,824

Claims priority, application Germany, Apr. 28, 1970, P 20 20 711.8

Int. Cl. G01n *1/18*

U.S. Cl. 73—423 A **10 Claims**

A sample distributor for a liquid substance being examined has containers for all samples and for individual sample portions along with a part inseparably connected therewith for receiving sample information. The distributor also includes a supply unit for total sample containers, a reader for reading the information of total sample containers, a store tank receiving the individual sample containers, a supply unit for forwarding the individual sample containers to a sample dosing device and an information transmitting device. The sample dosing device receives a predetermined amount of liquid corresponding to the actual investigation program from the total sample container and transmits it to the individual sample



containers, while the information transmitting device transmits information received by the reader to the individual sample containers. There are also provided means receiving the filled individual sample containers provided with information, as well as a device steering and supervising the entire operation of the sample divider.

3,751,986

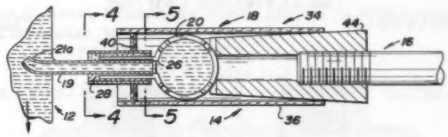
SAMPLING APPARATUS

Joseph J. Boron, Doylestown, Pa., assignor to Aikoh Co. Ltd., Tokyo, Japan

Filed Mar. 31, 1972, Ser. No. 240,239

Int. Cl. G01n *1/12*

U.S. Cl. 73—425.4 R **7 Claims**



The specification and drawings disclose three embodiments of an apparatus for taking samples from a flowing stream of molten metal. The preferred embodiment comprises a separable sample mold having a thermal shock resistant tube connected thereto. The mold and tube are slidably mounted in a cylindrical, open ended housing. The housing is arranged to totally enclose the mold and tube in a first position. In a second position the tube extends out of the housing for sample taking. Other features disclosed include an arrangement for providing a small diameter pin of sample metal and a system for bonding a hook or loop of metal in the sample for tagging purposes.

3,751,987

DYNAMIC BALANCING MACHINES

Brian Edward Whitmore, 7, The Croftway, Handsworth Wood, England

Filed June 29, 1971, Ser. No. 158,043

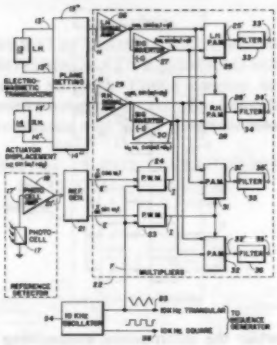
Claims priority, application Great Britain, July 7, 1970, 32,856/70

Int. Cl. G01m *1/22*

U.S. Cl. 73—465 **15 Claims**

The present circuit arrangement provides a control signal or control signals for an automatic balancing machine, which signals are displayed on the screen of a cathode ray tube

preferably in the manner of a plan position indicator. The displayed signal is produced from a balance information signal and a reference information signal supplied to the inputs of a



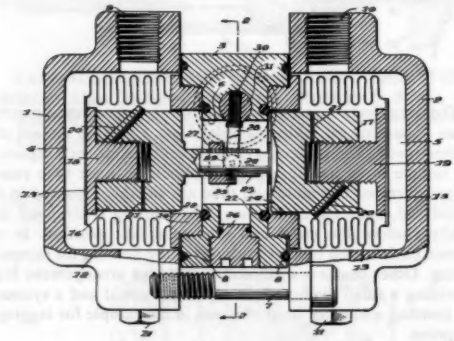
multiplier circuit the outputs of which are connected to a display circuit which in turn is connected to control a cathode ray tube.

3,751,988

DIFFERENTIAL PRESSURE RESPONSIVE DEVICE

William M. Reese, Sr., Dallas, Tex., assignor to Mary Catholeene Reese, Dallas, Tex.

Filed Mar. 30, 1971, Ser. No. 129,364
Int. Cl. F16j 3/00; G01l 7/06
U.S. Cl. 92—37 7 Claims



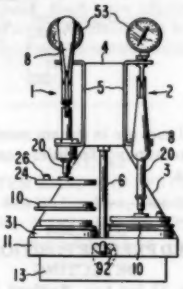
A differential pressure responsive device which uses two opposed bellows mounted on a center plate and exposed externally to differential pressures. Flow between the interiors of the bellows is provided through a center plate opening or passage controlled by valves that are connected with the free ends of the bellows through adjustable connections. Suitable means is provided for transmitting motion exteriorly of the housing of the meter through a torque shaft operatively connected with the tie connections between the bellows so as to be moved in response to fluctuations of the bellows. A range spring is connected with this shaft to control the range of the meter.

3,751,989

FIXTURE AND SYSTEM FOR TREATING TEST PIECES ON A RAPID CYCLE LEAK DETECTION APPARATUS

Walton E. Briggs, Lynnfield, and Paul R. Fruzzetti, North Easton, both of Mass., assignors to Varian Associates, Palo Alto, Calif.

Filed July 2, 1971, Ser. No. 159,234
Int. Cl. G01m 3/04
U.S. Cl. 73—40.7 10 Claims



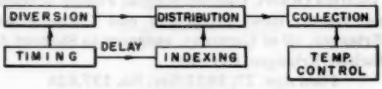
The test piece is clamped to the base of the fixture in such a way that one side of said test piece is exposed to a vacuum created by the leak detection apparatus and the other side of said test piece is exposed to a test-gas receiving chamber. The act of clamping the test piece to the base of the fixture causes the test-gas receiving chamber to be formed and simultaneously causes a test gas such as helium to fill said chamber to a predetermined pressure. After the test piece has been clamped into testing position and the test gas has filled the test-gas chamber, a mechanism is activated which admits air to said chamber at higher pressure than said test gas therein and which simultaneously activates the leak detection apparatus. Before the leak detection apparatus connects said one side of the test piece to vacuum, the high-pressure air is cut off and said test-gas chamber contains only a small quantity of high-pressure air and is not open to the source of high-pressure air. Thus, if a particular test piece has a leak, the quantity of high-pressure air passing through the leak will be insufficient to damage the delicate mechanism of the leak detection apparatus.

3,751,990

LIQUID SAMPLING

Robert M. Blechman, Honey Brook Twp., Chester County, Pa., assignor to Pro-Tech, Inc., Malvern, Pa.

Filed Aug. 30, 1971, Ser. No. 175,996
Int. Cl. G01n 1/18; B01d 15/08
U.S. Cl. 73—423 R 11 Claims



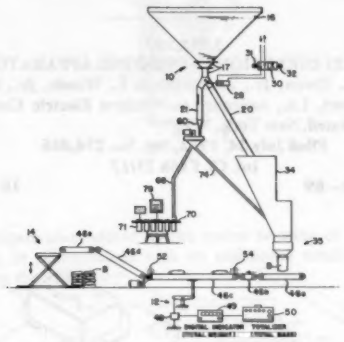
Sampling of liquids to isolate discrete samples is accomplished by flowing the liquid through an intermittently actuated diverter from which successive samples flow to different collection locations through appropriate distribution means including a distributor arm movable stepwise to discharge into separate collector lines. Timed actuation of the diverter and distributor is provided by electrical relays and related controls.

3,751,991

PARTICULATE SOLID MATERIAL INSPECTION SYSTEM

Glen W. Fisher, Bellevue, and Fred A. Franz, Mercer Island, both of Wash., assignors to Technovator, Inc., Seattle, Wash.

Filed May 21, 1971, Ser. No. 145,784
Int. Cl. G01r *1/20*
U.S. Cl. 73—421 R 7 Claims



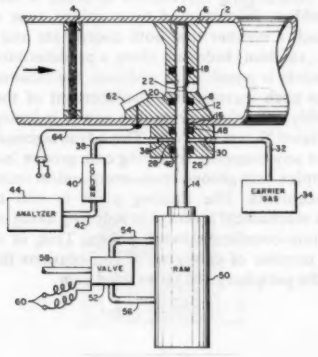
Particulate solid material is automatically sampled while bags are being packed and the bags are automatically weighed and counted. A preferred form of sampler intercepts the entire transverse cross-section of the stream of material momentarily to remove an unbiased sample from the stream.

3,751,992

CHROMATOGRAPHY VALVE

David A. Morgan, North Wales, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed July 7, 1971, Ser. No. 160,463
Int. Cl. G01n *1/10*
U.S. Cl. 73—422 GC 4 Claims



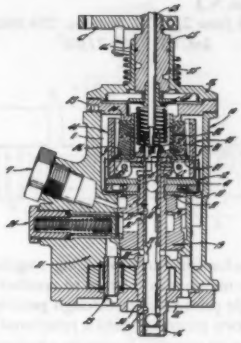
A sampling device for extracting a sample to be analyzed having a volume less than 0.01 microliter from a fluid stream by selectively introducing a slideably supported shaft into the fluid stream to expose a sample retaining capillary hole in the shaft to the fluid stream. An ultrasonic oscillator is positioned in the the fluid stream to add vibrational energy thereto to force a liquid sample into the capillary hole. The shaft is, subsequently, withdrawn from the fluid stream to deliver the fluid sample to a fluid analyzing means.

3,751,993

MAGNETIC BALL HEAD SPEED GOVERNOR

Donald L. Davis, Rockford, Ill., assignor to Woodward Governor Company, Rockford, Ill.

Filed June 14, 1972, Ser. No. 262,705
Int. Cl. G01p *3/16*; G05g *13/24*
U.S. Cl. 73—518 12 Claims



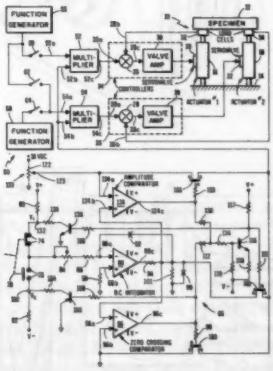
The magnetic biasing winding of a magnetic ball head speed governor is spaced radially of the flyweights for increased mechanical advantage which permits the speed of an associated prime mover to be adjusted over an appreciable range by adjustment of the magnetic bias level. The flyweights may comprise permanent magnets to provide a "polarized" governor or non-magnetized magnetic material to provide a "non-polarized" governor. The magnetic bias winding may be disposed radially inwardly or outwardly of the flyweights.

3,751,994

OSCILLATORY SIGNAL SYSTEM WITH TURN ON AND TURN OFF RATE CONTROL

Alan E. Gross, Minnetonka, Minn., assignor to MTS Systems Corporation, Minneapolis, Minn.

Filed Jan. 18, 1971, Ser. No. 107,343
Int. Cl. G01n *3/32*
U.S. Cl. 73—67.3 26 Claims



A full scale oscillatory signal is multiplied by a ramp-type amplitude controlled rate signal to provide an output signal increasing linearly from zero volts to a full scale peak-to-peak value and then decreasing linearly back to zero. The rise portion of the ramp signal provides a controlled turn on rate for an oscillatory program command for material testing apparatus to avoid destruction of the specimen being tested, and the fall portion of the ramp signal provides a controlled turn

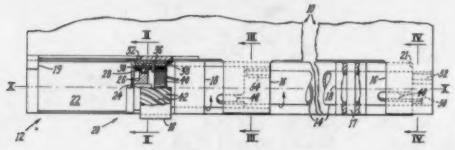
off rate. Multi-channel test systems can be similarly controlled, only a single potentiometer being required for controlling the amplitude of all channels simultaneously.

3,751,995

SEQUENTIAL ROTARY AND LINEAR ACTUATING MECHANISM

John H. Carlson, Danvers, Mass., assignor to USM Corporation, Flemington, N.J.

Filed June 2, 1972, Ser. No. 259,080
Int. Cl. F16h *21/00*
U.S. Cl. 74—20 **7 Claims**



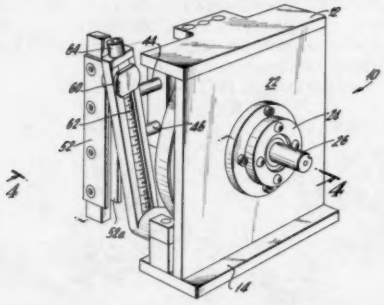
A compact mechanism for controlling angular and lateral positioning of one member in relation to another. Actuation is effected by a single prime mover through gearing of a type to rotate one of the two members until a rotational stop position is reached whereupon reaction forces on a helical spline cause relative lateral displacement until a predetermined locking relation is attained. The relative movement may sequentially be reversed and unlocked to restore the initial hinged relation.

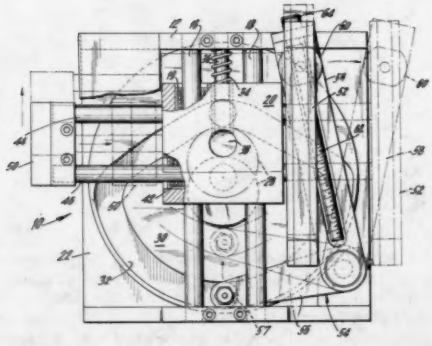
3,751,996

DEVICE FOR TRANSMITTING ADJUSTABLE TRANSLATORY MOVEMENTS IN TWO AXIS-DIRECTIONS

Earl F. Beezer, One Andrea Blvd., Saddle Brook, N.J.

Filed Nov. 3, 1971, Ser. No. 195,271
Int. Cl. F16h *25/12*
U.S. Cl. 74—53 **11 Claims**





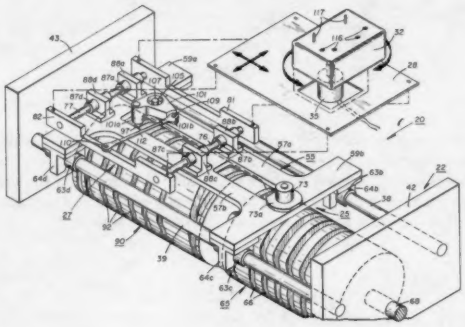
A device for transmitting accurate movements from a rotary input shaft to two separate axis-movable members comprises a first member which is guided for movement along one axis and a second member which is guided on the first member for movement along a second axis. The shaft carries a separate cam for driving each member which is adjustably connected to at least one of the members so that the controlled movement may be adjusted for each shaft rotation. The adjustable connection advantageously includes a lever with a roller follower which is guided by the cam and an arm which carries a shiftable pivot connection to a slideway carried on one of the movable members.

3,751,997

MULTI-DIRECTIONAL INDEXING APPARATUS

William L. Owen, Jr., and William L. Woods, Jr., both of Shreveport, La., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed July 24, 1972, Ser. No. 274,466
Int. Cl. F16h *25/12*
U.S. Cl. 74—89 **18 Claims**



A multi-directional indexing apparatus utilizes a multi-revolution cam driving mechanism to index X and Y cross-slide assemblies, intercoupled by a unique type of floating pivot, in such a manner that both coordinate and non-coordinate (i.e., random) indexing along a predetermined pattern of index points is possible. In addition, the floating pivot, in response to each incremental displacement of the X cross-slide assembly, effectively presents a new Y indexing cam face to an associated Y cam follower. This advantageously obviates the need for any common, recurring cam groove index points, and/or complex cam groove cross-overs and/or indexable cam axis displacements. The floating pivot is also capable of providing a mechanical leverage in indexing along either coordinate or non-coordinate index points. This, in turn, maximizes the number of cam groove convolutions that may be formed in the periphery of a given sized cam.

3,751,998

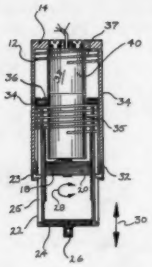
LINEAR ACTUATOR

Anastasios J. Vasilatos, 244 Hibbard Rd., Wilmette, Ill.

Filed May 18, 1971, Ser. No. 144,490
Int. Cl. F16h *27/02*
U.S. Cl. 74—89.15 **15 Claims**

A motor driven linear actuator arranged with the motor interior of the actuator plunger. The motor has affixed to its output shaft a worm gear which is engaged with corresponding

teeth of an internal worm cut into the interior face of the plunger. The plunger is guided and supported during its selective reciprocation either by the motor housing or the motor housing in combination with an additional tubular housing covering the actuator.



3,751,999

ARRANGEMENT FOR MOUNTING A PUSH-BUTTON OR THE LIKE ON A CONTROL PANEL

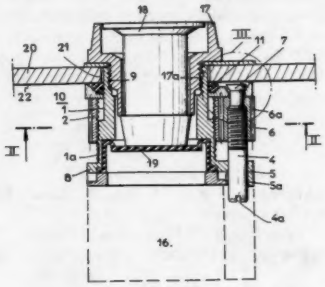
Christian L. Jollivet, 57 rue Louise Michel, Levallois, France

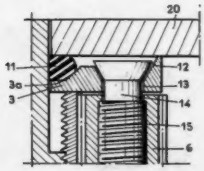
Filed June 2, 1971, Ser. No. 149,269

Claims priority, application France, June 11, 1970, 7021394

Int. Cl. F16h *27/02*

U.S. Cl. 74—89.15 **5 Claims**





An arrangement for fixing a push-bottom or the like having a cylindrical body in an opening in a panel, the cylindrical body, in use, being connected to a retaining flange intended to cooperate with the front surface of the panel, and a nut threaded onto the cylindrical body for locking the member, via a washer, against the rear surface of the panel, wherein the nut is provided on its periphery with gear teeth which mesh with a pinion fixed to a spindle rotatable in a bearing associated with the washer, means being provided to locate this spindle and rotate it from the rear of the arrangement.

3,752,000

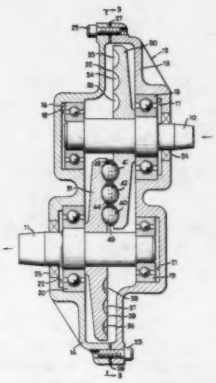
VARIABLE SPEED FRICTION DRIVE TRANSMISSION

Richard W. Roberts, Lombard, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 17, 1971, Ser. No. 209,087

Int. Cl. F16h *15/04, 15/08*

U.S. Cl. 74—190.5 **26 Claims**



A friction drive transmission featuring a plurality of balls subjected to a compressive force, necessary to the transmission of driving torque from a driving friction member to a driven friction member, produced by an automatic self-energizing wedging action between the balls and the driving and driven members to provide one or more finite speed rations.

3,752,001

ELECTRO-HYDRAULIC PULSE MOTOR

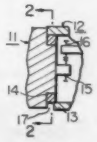
Seiuemon Inaba, Kawasaki; Kohei Ito, Fujisawa; Kanryo Shimizu, Kawasaki, and Youichi Amemiya, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki-shi, Kanagawa-ken, Japan

Filed Dec. 13, 1971, Ser. No. 207,164

Claims priority, application Japan, Dec. 26, 1970, 45/131961

Int. Cl. F16h *55/18*

U.S. Cl. 74—409 **5 Claims**



This disclosure relates to an improved electro-hydraulic pulse motor wherein an eccentric ring is provided for a joint of the electric pulse motor part and four way pilot valve part so that adjustment of the backlash in the reduction gear between the electric pulse motor part and the four way pilot valve part can be properly carried out from outside, and therefore the electro-hydraulic pulse motor can be adjusted so as to have excellent performances without the interior thereof being contaminated with dust and other foreign material.

3,752,002

MECHANICAL MOVEMENT

Charles Block, 1129 Albert Rd., North Bellmore, N.Y.

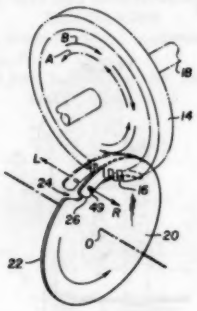
Filed Jan. 10, 1972, Ser. No. 216,697

Int. Cl. F16h *57/10, 1/16, 29/10*

U.S. Cl. 74—404 **13 Claims**

A mechanical movement having a driven body and a driving body set at angles to each other. The driven body provided

with teeth about its periphery and the driving body with a circular edge adapted to enter between the teeth and means for its rotation about a central axis. The edge being normally cir-



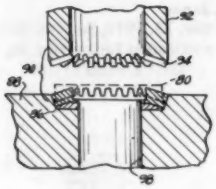
cular but having a separable end adapted to be flexed to either side of the plane of the circle. Means are provided to flex the separable edge during rotation of the driving body.

3,752,003

COMPOSITE HEAVY-DUTY MACHINE ELEMENT AND METHOD OF MAKING THE SAME

William M. Dunn, Farmington, and Myron C. Sarnes, Northville, both of Mich., assignors to Federal-Mogul Corporation, Southfield, Mich.

Filed Dec. 4, 1970, Ser. No. 95,310
Int. Cl. F16h *55/04*; B21d *53/28*
U.S. Cl. 74—434 5 Claims



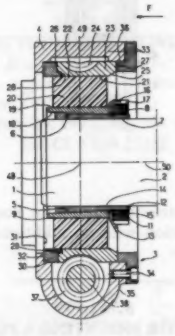
A composite heavy-duty machine element, such as a face gear (FIG. 7), has its working or load bearing portion composed on sintered powdered high-performance alloy while its supporting portion not subjected to concentrated or intense heavy loads is made of a base metal such as sintered powdered iron. In FIGS. 1 through 8 the powders of the two portions are inserted separately and successively in the die cavity of a briquetting process and simultaneously compacted to form a composite briquette which is then sintered to bond the separate portions together even though they are of different materials with different physical characteristics. The face gear as briquetted and sintered is then subjected to a further deforming operation to further incline its teeth. The resulting composite sintered powdered metal face gear is of lower material cost than such an element formed of high-performance alloy in its entirety, and may then be used as it is of satisfactory density for its intended use, or it may be further densified by means of an additional compressing operation with the article cold, warm or by a hot forging operation, or with subsequent sintering if deemed necessary depending upon its intended use.

3,752,004

BEARINGS

Pierre Joseph Hanssen, Schweighouse s/Moder, France, assignor to Hanssen & Cie S.A., Schweighouse s/Moder, France

Filed Dec. 10, 1971, Ser. No. 206,714
Claims priority, application France, May 7, 1971, 7117690
Int. Cl. F16h *55/14*
U.S. Cl. 74—443 4 Claims



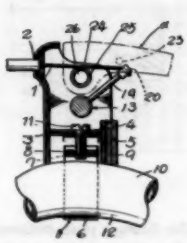
An end bearing for the shaft of a printing or other roller about which web or strip material is passed in a machine. The bearing has a first or inner sleeve which is fitted on the shaft and has a tapered outer face axially sliding in a second sleeve with a tapered inner face for joint assembly. Attached around the second sleeve is an anti-vibration transmission cylinder or sleeve of rubber material mounted in an annulus disposed in a static part of the bearing secured to the machine, which annulus is rotatable by gearing to vary the angular position of a shaft received in the inner sleeve which varies the angle of a roller mounted thereon.

3,752,005

BRAKE FOR BICYCLES

Tomizo Yoshikawa, Lot 9 of 10 Ban, 2 Chome, Imaike-cho, Sakai-shi, Osaka, Japan

Filed Dec. 8, 1971, Ser. No. 205,840
Claims priority, application Japan, Dec. 10, 1970, 45/123791
Int. Cl. G05g *11/00*
U.S. Cl. 74—480 R 7 Claims



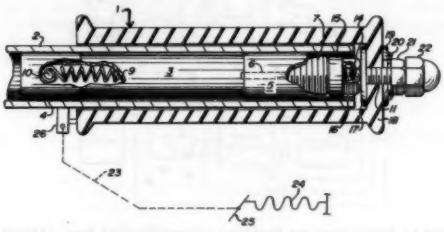
A brake for drop handle type bicycles characterized in that a brake lever comprising a main lever and an auxiliary lever mounted to a drop handle portion of a bicycle can be operated with a cyclist's fingers reaching therefor from any optional gripping positions of the drop handle thereby enabling him to apply the brake exactly so as to wheel on with safety.

3,752,006

THROTTLE ASSIST MECHANISM FOR MOTORCYCLE

Charles M. Bartlett, 6613 E. Indian School Rd., Scottsdale, Ariz.

Filed July 24, 1972, Ser. No. 274,417
Int. Cl. G05g 1/08, 7/00
U.S. Cl. 74—489 7 Claims



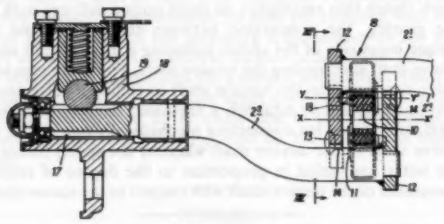
In order to alleviate the torsional tension ordinarily required to be maintained constantly to hold a given motorcycle throttle opening, means are provided to apply a partially compensating torque in the opposite direction. The end of the motorcycle twist grip which the operator utilizes to control the throttle. A slightly expansible tubular member, dimensioned to fit within the handlebar, is provided with a tapered expander member for firmly securing the tubular member within the handlebar. A torsion spring within the tubular member is fixed thereto at a first end and is connected to a threaded shaft at its opposite end. The threaded shaft extends through and is fixed to the end of the twist grip, and means are provided for adjustably setting up the torque exerted by the torsion spring, which torque opposes that developed in the twist grip by the usual throttle return spring acting through the conventional cable to which the twist grip is operatively connected in the well known manner.

3,752,007

SAFETY COUPLINGS FOR AUTOMOTIVE STEERING COLUMNS

Jacques Blondeleau, and Marcel Misseri, both of Billancourt, France, assignors to Regie Nationale des Usines Renault, Billancourt (Hauts de Seine) and Automobiles Peugeot, Paris, both of France

Filed Dec. 13, 1971, Ser. No. 207,174
Claims priority, application France, Dec. 16, 1970, 7045326
Int. Cl. B62d 1/18
U.S. Cl. 74—492 4 Claims



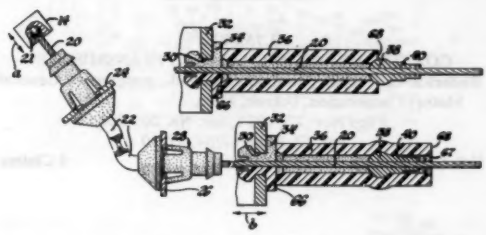
Safety device for steering column of motor vehicle, which comprises a steering column made of a plurality of elements assembled by means of joints of which one consists of a vibration damping coupling, characterized in that the vibration damping member proper surrounds partially at least one of the two elements of the steering column and that each element comprises torque transmission elements rotatably solid with said vibration damping member.

3,752,008

CABLE LENGTH ADJUSTER

Michael J. Danek, Laingsburg, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 31, 1971, Ser. No. 176,477
Int. Cl. F16c 1/10
U.S. Cl. 74—501 R 7 Claims



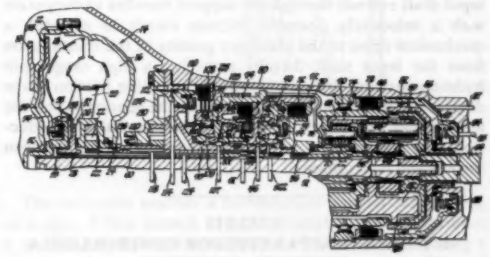
The cable length self-adjusting arrangement illustrated includes an accelerator pedal and a pivotable lever having a cable extending therefrom to a transmission detent valve. The detent valve cable is freely mounted through a bracket on the accelerator pedal lever. A spherical member is secured to the cable with a polyurethane sleeve member initially loosely mounted around the cable between the bracket and the spherical member. Upon the initial depression of the accelerator pedal after assembly, the bracket abuts against the sleeve member which, in turn, abuts against the spherical member, causing the detent valve to quickly bottom out. Full depression of the pedal thereafter to its wide open throttle position forces the sleeve member over the spherical member to a final position which is thereafter retained to coordinate the bottomed out position with the wide open throttle position of the accelerator pedal.

3,752,009

AUTOMATIC TRANSMISSION AND CONTROLS

Howard E. Chana, 1305 Westwood Dr., Flint, Mich.

Division of Ser. No. 59,467, July 30, 1970, Pat. No. 3,638,771.
This application Sept. 3, 1971, Ser. No. 177,771
Int. Cl. F16h 47/00; B60k 21/00
U.S. Cl. 74—645 12 Claims



Power transmission having torque converter drivingly connected to a planetary gear unit conditionable by selective engagement of friction drive establishing devices to provide for four forward drives and one reverse drive. A converter clutch normally held from engagement by the feed of fluid into the converter through a clutch control chamber can be engaged by converter pressure in response to an upshift signal and subsequent exhaust of fluid from the control chamber to permit mechanical drive of the gear unit. A shift valve forming part of hydraulic controls provides a signal pressure to open a converter feed restrictor valve to permit the converter to be fed

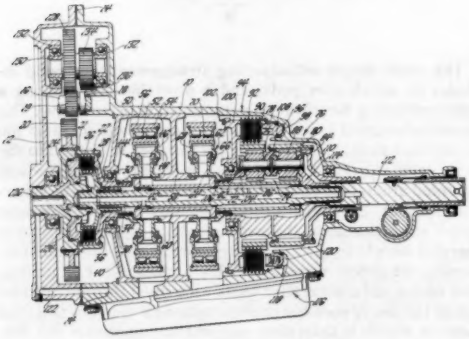
with operating oil through a second feed passage. The signal from this valve also activates an accumulator valve system which controls the engagement of the converter clutch so that converter clutch capacity is gradually increased to a maximum. There is a detent valve which provides for 3–2 and 4–3 part throttle downshifts and 4–2, 3–2 and 2–1 full throttle downshifts.

3,752,010

COAXIAL HYDROMECHANICAL TRANSMISSION

Roderick G. Tipping, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 22, 1971, Ser. No. 200,808
Int. Cl. F16h *47/04, 57/10*
U.S. Cl. 74—687 **4 Claims**



A synchronous shifting variable ratio hydromechanical transmission including a variable ratio hydraulic transmission, a multi-ratio planetary gearing arrangement, and a housing with a support member positioned therein. The variable ratio hydraulic transmission has a pump and a motor rotatably mounted and axially aligned on opposite sides of the support member. An input shaft drivingly connected to the pump, is rotatably supported in the housing. An output shaft axially aligned with the input shaft is rotatably journaled in the housing and is drivingly connected with the planetary gearing arrangement. An intermediate shaft axially aligned with the input shaft extends through the support member to cooperate with a selectively operable friction clutch to establish a mechanical drive to the planetary gearing of the transmission from the input shaft thereby providing a high range split hydromechanical drive. A selectively operable friction brake disposed in the housing cooperates with the gearing to provide a low range hydrostatic drive with a mechanical gear reduction. The transmission permits synchronous shifting between the low and high ranges.

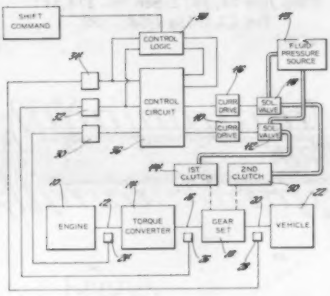
3,752,011

METHOD AND APPARATUS FOR CONTROLLING A POWER TRANSMISSION

Gary L. Casey, Royal Oak, and James A. Cogswell, II, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 18, 1971, Ser. No. 190,235
Int. Cl. F16h *47/00*; B60k *21/00*
U.S. Cl. 74—731 **9 Claims**

In a transmission having a torque converter and a gear set wherein a ratio shift is accomplished by disengaging a brake or clutch and engaging another, a smooth shift is effected by controlling the clutch or brake pressures as a function of continuously computed values of turbine torque, turbine acceleration, and instantaneous gear ratio. These three parameters are computed by electronic analog circuitry from measured values of engine speed, turbine speed and transmission output speed. A logic circuit responsive to shift command, turbine speed and



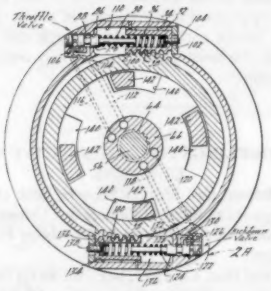
output speed conditions the analog circuit for operation. The analog output signal is converted to pressure by a solenoid valve.

3,752,012

POWER TRANSMISSION MECHANISM HAVING A TORQUE SENSITIVE PRESSURE REGULATOR VALVE

William D. Ross, Plymouth, and Hesham A. Roushdy, Taylor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 12, 1971, Ser. No. 198,149
Int. Cl. F16h *17/00*; B60k *21/00*
U.S. Cl. 74—731 **3 Claims**



A power transmission mechanism having a hydrokinetic torque converter and multiple ratio gearing wherein the turbine is connected to the torque input element of a forward drive clutch that establishes an input torque delivery path for the gearing, the connection between the turbine and the torque input side of the clutch including a torsion shaft and a sleeve shaft surrounding the torsion shaft, a pressure regulator valve connected to the torsion shaft including a valve spring that is calibrated to establish a regulated operating pressure level, and means for connecting mechanically one end of the sleeve shaft to the torsion shaft whereby the spring forces on the latter are varied in proportion to the degree of relative movement of the torsion shaft with respect to the sleeve shaft.

3,752,013

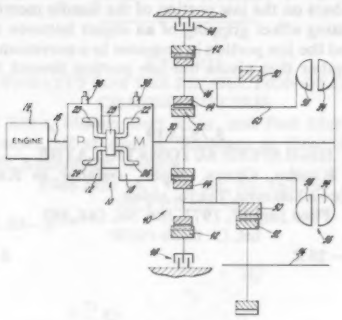
POWER TRANSMISSION HAVING A HYDROSTATIC DRIVE COMBINED WITH A HYDRODYNAMIC DRIVE

Norman A. Cross, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 26, 1972, Ser. No. 247,654
Int. Cl. F16h *47/00*
U.S. Cl. 74—732 **4 Claims**

A power transmission having a hydrostatic portion and a hydrodynamic portion. The hydrostatic portion, operable

through an infinitely variable range, is combined with a planetary gear reduction unit to provide a low speed range. The

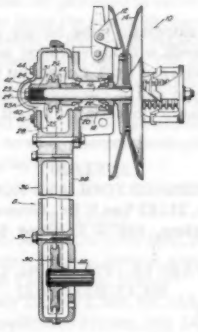


hydrostatic and hydrodynamic portions are combined to provide an infinitely variable high speed range.

3,752,014
CHAIN TRANSFER CASE WITH ACCESSORY TRANSMISSIONS

Maurice O. Holtan, 2012 Menomonee River Pky., Wauwatosa, Wis.

Filed Jan. 8, 1971, Ser. No. 104,895
Int. Cl. F16h *3/02*
U.S. Cl. 74—745 **20 Claims**



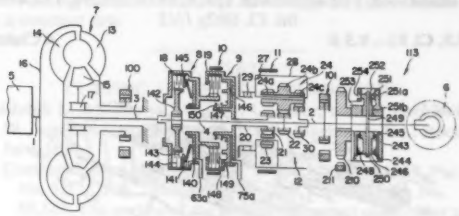
A chain drive transfer case is adapted for optional use with various accessory transmissions or rate changers which are interchangeably attached to one side of the chain case. The chain case includes an input shaft which has a splined end projecting through an opening in the case for coupling with the input shaft of any of the accessory transmissions or for use with an engagement or neutral lockout attachment. Each of the accessory transmissions has a tubular output shaft which is concentric with the chain case input shaft and which extends through said opening in the chain case to drivingly engage a chain sprocket which is supported on the chain case input shaft.

3,752,015
HYDRAULIC CONTROL SYSTEM FOR AUTOMATIC SPEED CHANGING DEVICES

Noboru Murakami, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan

Filed July 12, 1971, Ser. No. 161,549
Claims priority, application Japan, July 11, 1970, 45/60758
Int. Cl. B60k *21/00*
U.S. Cl. 74—869 **7 Claims**

In an automatic speed changing device such as an automotive power transmission in which there is provided at least first friction engaging means to complete a low speed ratio power train therethrough and second friction engaging means to complete a high speed ratio power train and, a hydraulic control system therefor is equipped with a closely cooperating

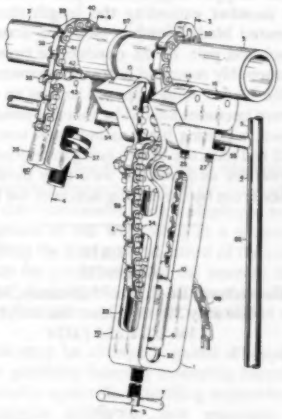


pair of pressure reducing valves. The fluid pressure being delivered as desired to the first and second friction engaging means from manual valve means for a shift from one speed ratio to another is controlled by the pressure reducing valves to prevent shocks due to the transition.

3,752,016
WRENCH

Estus E. Ballard, 1211 E. Gurley, Prescott, Ariz.

Filed Dec. 1, 1971, Ser. No. 203,520
Int. Cl. B25b *13/52*
U.S. Cl. 81—64 **9 Claims**



The invention teaches a combination wrench for working on a pipe. A first wrench of the combination wrench includes a continuous chain mounted within a framework, including a plurality of sprockets, rollers, and tensioning means. Manual or power means is connected to a sprocket of the set of sprockets to drive the continuous chain. A portion of the chain circularly engages a first pipe and tends to cause the first pipe to rotate. A second wrench of the combination wrench is secured to a second pipe by tightening a chain about the second pipe in a non-slipping engagement. A stabilizing member disposed between the first wrench and the second wrench stabilizes their respective movement whereby the pipe secured by the first wrench will be stationary with respect to the pipe secured by the second wrench. In this manner, the first and second pipes may be rotatably secured to each other or rotatably separated from each other.

3,752,017

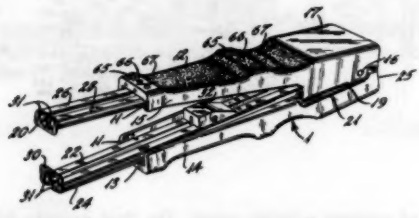
THERMAL HAND TOOLS

Richard E. Lloyd, Beltsville; Loring E. Young, Frederick, and William J. Siegel, Silver Spring, all of Md., assignors to Pace Incorporated, Silver Spring, Md., by said Lloyd and Young

Continuation-in-part of Ser. No. 41,325, May 28, 1970, abandoned. This application Apr. 8, 1971, Ser. No. 132,499

Int. Cl. H02g *1/12*

U.S. Cl. 81—9.5 B **4 Claims**



The present invention relates to a group of hand thermal tools of simplified construction wherein each has the same upper and lower hand grip members hinged together adjacent to their rear ends and moreover the upper and lower grip member may be identical. A power lead line, extending in at the rear of the grip members, powers each tool. The three distinct thermal hand tools contemplated are; resistance tweezers, conductive tweezers, and wire stripper. The resistance tweezers has a single conductor rod in each grip member extending the length thereof and a tweezer blade removably mounted at the forward end of each rod whereby an electrically conductive object tweezed between the blades becomes resistance heated. The conductive tweezers and the thermal wire stripper each utilize a pair of conductive rods in each grip member extending the length thereof and a resistance heated blade member mounted across the forward ends of each rod pair. In the conductive tweezer, a gripping blade is removably mounted across the forward ends of each rod pair, the blades being opposed so that an object tweezed therebetween becomes heated by thermal conductivity. In the wire stripper, a cutting blade is mounted across the forward end of each rod pair, the blades being in opposing cutting relationship whereby an insulated wire may have the insulation stripped therefrom by the cutting action of the heated blades.

3,752,018

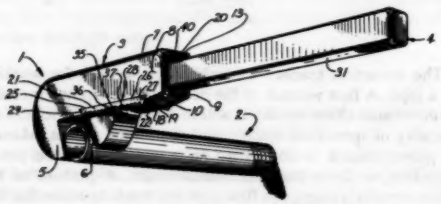
WRENCH

Robert J. Henricksen, Rt. 2, Box 75, Jackson, Mo.

Filed July 29, 1971, Ser. No. 167,121

Int. Cl. B25d *13/24*

U.S. Cl. 81—147 **8 Claims**



A wrench for gripping pipe and the like includes a housing having a chamber therein and a jaw member depending therefrom. A handle member has one portion within the chamber and an elongated portion extending outwardly through an open end of the housing opposite said jaw member. A jaw portion on said handle member extends outwardly through an elongated slot in the housing in facing relation with the jaw member and said housing and handle member are relatively movable to selectively adjust the space between the jaw member and jaw portion. Cooperating and inter-engaging fulcrum members on the jaw portion of the handle member and on the housing effect gripping of an object between the jaw member and the jaw portion in response to a movement of the handle member that pivots the jaw portion toward the jaw member.

3,752,019

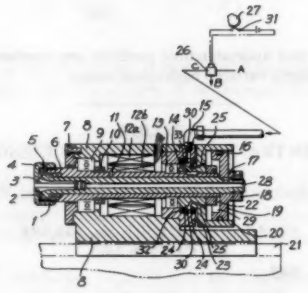
HIGH SPEED AUTOMATIC LATHE

Yoshitada Kaneko, Okaya, Japan, assignor to Kabushiki Kaiska Suwa Seikasha, Tokyo, Japan

Filed July 27, 1971, Ser. No. 166,357

Int. Cl. B23b *19/00*

U.S. Cl. 82—28 R **2 Claims**



A high speed automatic lathe having a chuck which can rotate at high speeds without vibration such as would cause damage to the quality of work turned out thereby. The chuck is of the collet type and is circumferentially symmetrical so that possible causes of vibration are absent.

3,752,020

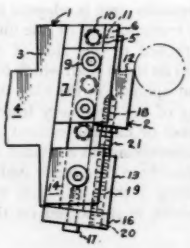
COMBINED TOOL AND HOLDER

Stuart W. George, 21182 Van K Dr., Grosse Pointe, Mich., and Henry R. Bucciero, 19674 Eastland Village Dr., Harper Woods, Mich.

Filed Apr. 13, 1971, Ser. No. 133,668

Int. Cl. B23b *29/22*

U.S. Cl. 82—36 R **6 Claims**



A tool holder having a shank forwardly terminating in a head elongated approximately vertically and formed with a mounting surface to receive a tool adjustable on the surface to be operative relative to a workpiece, a keeper to releasably retain the tool in position, and tool support means also adjustable, mountable upon the surface, the tool having an engageable portion which is engaged by the keeper and a machining portion, and said portions being so disposed relative to each other that resharpening of the machining portion leaves the engageable portion unaffected so that the entire engageable portion is usable throughout the life of the tool.

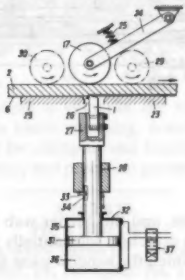
ERRATUM

For Class 82—86 see:
Patent No. 3,752,024

3,752,021
APPARATUS FOR THE PRODUCTION OF GUIDE CHANNELS OF SKIS

Oswald Klien, Mader; Gert Klien, and Paul Marte, both of Hohenems, all of Austria, assignors to Head Sportgerate GmbH, Kennelbach, Austria

Filed June 14, 1971, Ser. No. 152,950
Int. Cl. B26d *3/06*
U.S. Cl. 83—5 **11 Claims**

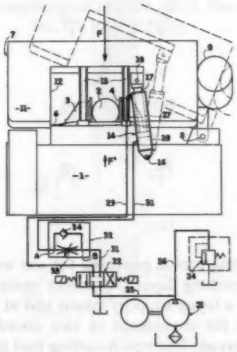


Apparatus for forming a guide channel in a plastic sliding surface of a ski. Means are provided to move the ski in its longitudinal direction to bring the plastic sliding surface into contact with a cutter which is fixed with respect to the longitudinal direction of movement of the ski. The cutter is shaped to correspond to the cross-section of the channel to be formed, and means are provided for obtaining relative movement of the cutter and the ski in a direction normal to the longitudinal direction of the ski so as to control the depth of the channel formed in the sliding surface.

3,752,022
SAWING METHOD AND MACHINE

Jacques L. J. Demurger, Roanne, France, assignor to Etablissements Demurger & Cie, Roanne, France

Filed July 19, 1971, Ser. No. 163,876
Claims priority, application France, July 24, 1970, 7027427
Int. Cl. B23d *55/08*
U.S. Cl. 83—13 **3 Claims**

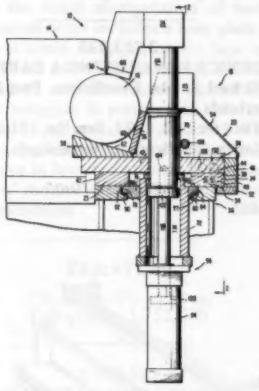


Method and machine for sawing a workpiece by means of a cutting tool, such as a band saw or saw blade, carried by a support. A hydraulic cylinder device controls the travel of the support and consequently the feed of the cutting tool. The working chamber of the cylinder device has a constant pressure which is a multiple of the maximum force opposing the feed of the tool. The rate of feed of the cutting tool into the workpiece is substantially constant owing to the fact that the liquid in the other chamber of the cylinder device opposed to the working chamber is made to flow out of the other chamber at a constant rate.

3,752,023
CUTTING APPARATUS AND METHOD

Rudolph L. Allison, and Willy J. Goellner, both of Rockford, Ill., assignors to Paramount Textile Machinery Co., Rockford, Ill.

Continuation-in-part of Ser. No. 838,220, July 1, 1969, Pat. No. 3,572,200. This application Nov. 12, 1970, Ser. No. 88,547. The portion of the term of this patent subsequent to Mar. 23, 1988, has been disclaimed.
Int. Cl. B26d *7/06, 7/02*
U.S. Cl. 83—27 **28 Claims**



A method and apparatus for severing a workpiece with a cutting tool returnable through the kerf or cut made thereby wherein at least one translatable slide is employed to move the uncut major portion of the workpiece in a generally linear direction away from the kerf prior to return of the cutting tool. Provision is made for predetermining the amount of translating movement of the slide in at least one generally linear direction of movement thereof in order to facilitate measuring operations.

The workpiece may be clamped against a support of the slide including a generally laterally extending supporting surface and a generally upwardly extending supporting surface with positive forces acting in two generally opposite directions, one acting generally downwardly of the slide and the other acting generally upwardly against a way on which the slide is supported.

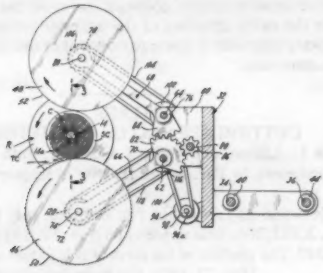
3,752,024
CUTTING MECHANISM FOR ROTARY KNIFE CUTTING MACHINES

David N. Judelson, 415 W. 23rd St., New York, N.Y., assignor to Oscar I. Judelshon Inc., New York, N.Y.

Continuation of Ser. No. 50,917, Aug. 22, 1960, Pat. No. 3,700,402.
Filed Nov. 6, 1962, Ser. No. 237,431
Int. Cl. B23b *3/04, 5/14, 37/00*
U.S. Cl. 82—86 R **9 Claims**

The present invention relates to rotary knife cutting machines which sever a roll of material wound on a core into

plural narrower rolls by utilizing two rotary knives that are opposed to each other on opposite sides of the work-piece axis



and by having knife feeding means that advances one of the knives into the workpiece by a fixed merement ahead of the other knife all during the working cut.

3,752,025

DEVICE FOR CUTTING A CARPET

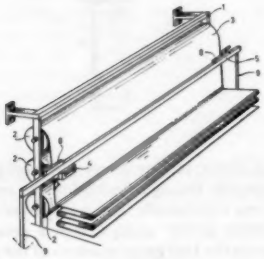
Theodorus Michael J. Van Everdingen, Post Box 52, Culemborg, Netherlands

Filed Oct. 22, 1971, Ser. No. 191,682

Claims priority, application Netherlands, Oct. 22, 1971, 7015473

Int. Cl. B23d *19/00*

U.S. Cl. 83—485 **4 Claims**



A device for cutting off any length from a carpet web comprising a section bar with a slidable gripping jaw at both extremities for co-operation with a border of the web, further comprising a cutting member slidable along said bar.

3,752,026

ENVELOPE WINDOW PUNCH

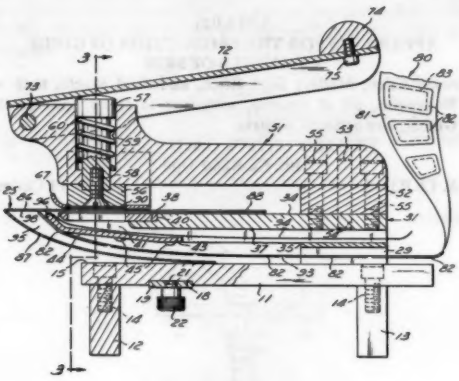
Feiten Michael O'Neill, 1276 Ramona Ave., Lakewood, Ohio

Division of Ser. No. 864,675, Oct. 8, 1969, Pat. No. 3,682,745. This application Jan. 7, 1972, Ser. No. 216,041

Int. Cl. B26d *5/08*

U.S. Cl. 83—589 **2 Claims**

An apparatus is disclosed for producing window envelopes from preformed windowless envelopes. Front and rear wall portions of a preformed envelope are separated, and a window opening is punched in one of the wall portions. A transparent window pane is located in the interior of the preformed envelope between the separated wall portions by a flexible carrier web and is removed from the carrier web within the interior of the envelope by passing the carrier web over a guide plate which abruptly changes the direction of travel of the carrier web. the window pane is removed from the carrier web and affixed to the interior surface of the one wall portion as the envelope is removed from the punching dies. The window panes are adhesively secured to the carrier web in longitudinally



spaced apart relation, and the carrier web is fed into and out of the envelope in a direction substantially parallel to the wall of the envelope to which the window pane is to be affixed.

3,752,027

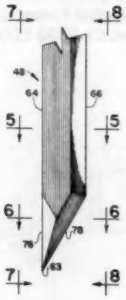
CUTTING TOOL FOR NOTCHING SHEET MATERIAL

Heinz Joseph Gerber, and David Raymond Pearl, both of West Hartford, Conn., assignors to Gerber Garment Technology, Inc., East Hartford, Conn.

Division of Ser. No. 13,506, Feb. 24, 1970, Pat. No. 3,626,799. This application June 1, 1971, Ser. No. 148,542

Int. Cl. B26d *3/14*

U.S. Cl. 83—613 **4 Claims**



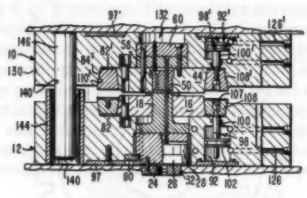
A notch cutting tool is provided for use with apparatus for cutting and notching layups of sheet material of the type which includes a layup support means and at least one cutting head mounted for movement in two coordinate directions relative to the layup. The notch cutting tool is driven from the cutting head and is adapted to move in a plunging fashion relative to the layup to form a notch or cut therein serving as an index mark on pieces cut from the layup by another cutting tool.

3,752,028

DIE APPARATUS FOR FINE BLANK STAMPING

George H. Waizmann, Dayton, and Robert G. Cook, Sr., New Carlisle, both of Ohio, assignors to The Gem City Engineering Co., Dayton, Ohio

Filed Oct. 4, 1971, Ser. No. 186,157
Int. Cl. B26f *1/14*; B26d *1/00*
U.S. Cl. 83—685 21 Claims



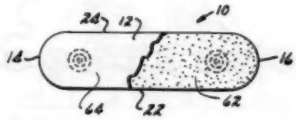
Apparatus including a versatile die set particularly advantageous for fine blank stamping, featuring a quick functioning shroud ring for clamping and locating die components with extreme accuracy and precision guides.

3,752,029

PICK HOLDER

Charles A. Watrous, 5959 Turbo Dr., Romulus, Mich.

Filed Mar. 19, 1971, Ser. No. 126,027
Int. Cl. G10d *3/00*
U.S. Cl. 84—329 6 Claims



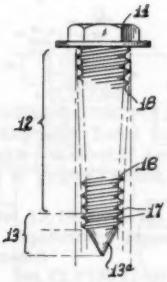
This invention and discovery is directed to musical instruments and more particularly to stringed instruments which are manipulated by the fingers or a pick, so that when switching from finger manipulation to the pick, the hand need not be taken from the instrument. This is accomplished by positioning the pick between two coils of a spring which is secured to the instrument by any suitable means.

3,752,030

SCREW

Frank V. Steurer, 12 Interstate Rd., Addison, Ill.

Continuation-in-part of Ser. No. 81,675, Oct. 15, 1970, abandoned. This application July 29, 1971, Ser. No. 167,419
Int. Cl. F16b *25/00*
U.S. Cl. 85—46 2 Claims



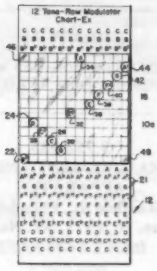
A threaded fastener for securing sheet materials using self tapping techniques to cause continuous spreading, and compressing of the material surrounding the pilot hole so as to minimize stripping and increase holding power.

3,752,031

TWELVE-TONE-ROW MODULATOR

Istvan Mohos, 300 W. 109th St., New York, N.Y.

Filed Aug. 5, 1971, Ser. No. 169,379
Int. Cl. G09b *15/02*
U.S. Cl. 84—471 6 Claims



A modulator for visual manipulation of twelve-tone-row sequences of musical notes includes a base plate having letter names of musical notes arranged on its face in 12 vertical columns and at least 24 horizontal rows, and a square template divided into 12 vertical columns and 12 horizontal row of squares. The template is punched in selected squares to provide windows in the order of a selected twelve-tone-row sequence and is applied to the face of the base plate in its original position or in inverted or rotated positions to present visual readings of the twelve-tone-row or its retrogrades, inversions or transpositions.

ERRATUM

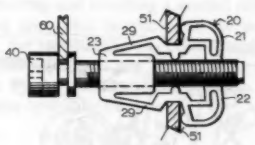
For Class 85—46 see:
Patent No. 3,752,030

3,752,032

SELF ATTACHING COUPLING

Theodore E. Fiddler, 1268 Suffield Dr., Birmingham, Mich.

Continuation of Ser. No. 21,025, March 19, 1970, abandoned. This application July 8, 1971, Ser. No. 160,630
Int. Cl. F16b *37/04*
U.S. Cl. 85—80 7 Claims



A coupling for mounting a screw in a hole in a wall with the coupling having paired jaws connected to a nut body by spring arms. The coupling is insertable in a hole with the nut body leading and the spring arms next following and engaging the edge of the wall at the hole to tortionally load the spring arms. Upon the spring arms by-passing the hole, the jaws enter the hole. Upon the jaws occupying the hole, the spring arms urge the jaws outwardly to engage both faces of the wall and the edges of the wall at the hole. The jaws have cam bosses at one face of the wall and shoulders at the other face of the wall. The cam bosses and the shoulders oppose one another to grip the wall therebetween. A web extends outwardly from the shoulders and connects to screw engaging pads spaced from the wall. A spring strip triangulates between the shoulders and the pads. Thus the pads and the nut body are spaced from the wall

on opposite sides. A screw lies between the nut body and the pads and is free of contact in the hole so that the screw and the coupling are bridge-spanned on each other through the hole. The screw may be assembled fully or partially with the coupling prior to insertion in the hole and the assembly inserted in the hole. Also, the coupling may be put in the hole first and the screw then turned into the coupling.

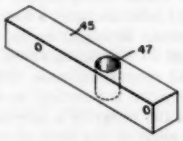
ERRATUM

For Class 86—485 see:
Patent No. 3,752,025

3,752,033
POWDER MEASUREMENT AND DISPENSING APPARATUS

John R. Ross, 5542 Hadfield St., Philadelphia, Pa.

Filed Nov. 16, 1971, Ser. No. 199,101
Int. Cl. F42b *33/02*
U.S. Cl. 86—31 **5 Claims**

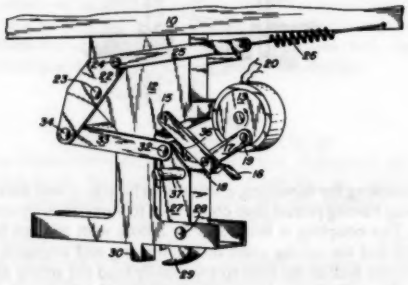


Apparatus for dispensing powder from a container to a cartridge shell includes a slidable member for receiving metering elements having different size openings extending therethrough for receiving predetermined amounts of powder. A valve adapted to be opened or closed is connected between the container and the slidable member. The slidable member may be reciprocated manually to receive powder in a metering element to dispense it to an empty shell. The apparatus may be associated with other apparatus to permit reconditioning the shell and inserting bullets therein.

3,752,034
PRACTICE MULTIPLE BOMB RACK

John H. Waters, 6240 Holly Bay Dr., Jacksonville, Fla.

Filed July 23, 1971, Ser. No. 165,555
Int. Cl. B64d *1/04*
U.S. Cl. 89—1.5 G **3 Claims**

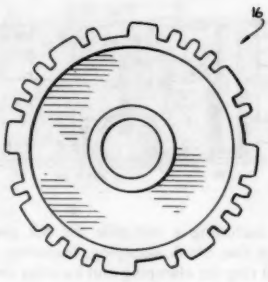


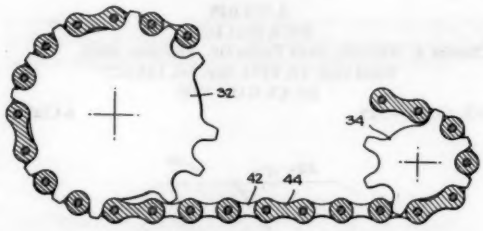
A bomb rack release mechanism having a sear and a rotating solenoid. The sear is pivotally mounted so as to block the movement of the bomb hook when in one position. A linkage couples the sear and solenoid such that actuation of the solenoid acts directly to remove the blocking action of the sear. The release mechanism of the present invention reduces the likelihood of inadvertant bomb release while reducing the time from solenoid actuation to bomb release.

3,752,035
AUTO-SYNCHRONIZING GEAR SYSTEM

Thomas William Cozzy, Burlington, and Robert Pettinga, Shelburne, both of Vt., assignors to General Electric Company, Burlington, Vt.

Filed Apr. 5, 1971, Ser. No. 130,994
Int. Cl. F16h *55/08*, *55/30*; F41d *9/06*
U.S. Cl. 89—13 R **12 Claims**



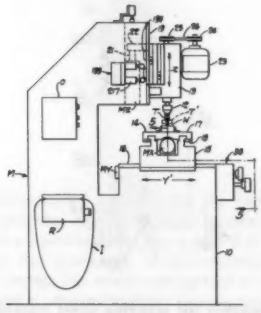


A transmission system is shown having shafts meshing cyclical members with respective teeth and tooth-spaces respectively arranged in combinational code groups which will only mesh when said members are in predetermined relative orientation.

3,752,036
PROGRAMMABLE FLUIDIC LOGIC CONTROLLED MACHINE TOOL

Morris R. Hicks, Brook Park, and Joseph C. Le Veque, Cleveland, both of Ohio, assignors to Bardons & Oliver, Inc., Cleveland, Ohio

Filed June 23, 1970, Ser. No. 49,098
Int. Cl. B23c *1/00*
U.S. Cl. 90—13 C **25 Claims**



A program controlled automatic machine tool having three carriages respectively movable parallel to X, Y and Z axes that

are perpendicular to each other. The X and Y carriages are horizontally movable along their respective axes to position a workpiece with respect to a cutting tool carried by the vertically movable Z carriage. A program on a suitable input record, such as punched paper tape, comprises a sequence of multi-digit X-position instructions and Y-position instructions as well as a Z-carriage motion instruction and suitable ancillary instructions. Each X and Y position instruction is entered into a fluid logic circuit that controls movement of the corresponding X or Y carriage. The carriages are commanded by the fluid logic circuits to move to the instructed positions. Position transducers associated with the respective X and Y carriages provide information to the fluid logic circuits as to the carriage positions. The carriage positions are compared to the position instructions and when correspondence is obtained for both X and Y carriages the Z carriage is enabled to cause a cut to be made in the workpiece. The procedure is repeated until all instructions in the sequence have been carried out.

3,752,037

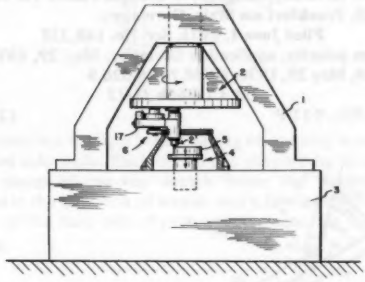
CAM CONTROLLED CUTTING APPARATUS

Nils O. Hoglund, Short Hills, N.J., assignor to Tri-Ordinate Corporation, Berkeley Heights, N.J.

Filed Nov. 24, 1971, Ser. No. 201,776

Int. Cl. B23d *1/30, 5/04*

U.S. Cl. 90—24.3 **25 Claims**



A cutting apparatus for cutting the surface of a workpiece along intersecting paths and including a cam-cam follower mechanism, cutting means mounted on the follower part of the mechanism, driving means for moving the cam and follower relative to each other to move the cutting means successively along said paths, and control means associated with the cam-cam follower mechanism for turning the follower on the cam to move the cutting means from one path to the other while holding the cutting means at the intersection of the two paths.

3,752,038

ELECTRO-HYDRAULIC PULSE MOTOR

Seiuemon Inaba, Kawasaki; Kohei Ito, Fujisawa; Kanryo Shimizu, Kawasaki, and Youichi Amemiya, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki-shi Kanagawa-ken, Japan

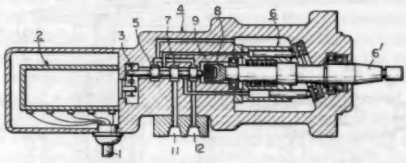
Filed Dec. 13, 1971, Ser. No. 207,105

Claims priority, application Japan, Dec. 26, 1970, 45/131958 (utility model)

Int. Cl. F15b *21/00*

U.S. Cl. 91—39 **1 Claim**

This disclosure relates to an improved electro-hydraulic pulse motor having an arrangement wherein novel stop means are provided for screw-nut coupling which couples the four-way pilot valve part to the hydraulic motor part while providing a feedback loop in the operation of the electro-hydraulic pulse motor so that the axial motion of a valve spool of the four-way pilot valve part which motion is driven by the electric pulse motor part, is properly restricted so as not to fail in delivering control action to the hydraulic line formed in the electro-hydraulic pulse motor.



3,752,039

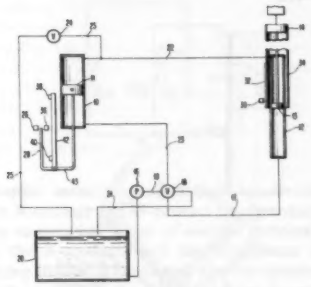
MASTER-SLAVE HYDRAULIC CONTROL SYSTEM

Thomas Fenton Hewins, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1971, Ser. No. 210,873

Int. Cl. F01b *25/04*; F15b *11/22*

U.S. Cl. 91—171 **7 Claims**



A master-slave hydraulic control system is disclosed which provides an improved synchronization control together with the ability to rapidly change the stroking characteristics of the cylinders by removing and inserting a second control member into a mounting apparatus moved with the master control piston. Further, the two pistons are continuously maintained in close synchronization and are not allowed to get out of synchronization by the accumulation of more than a slight quantity of captive hydraulic fluid or oil.

3,752,040

MULTI PISTON POWER PACK UNIT FOR FLUID ACTUATED TOOL

James A. Pawloski, Rt. 97, P.O. Box 13, North Woodstock, Conn., and Grahame F. Williams, 801 South St., Southbridge, Mass.

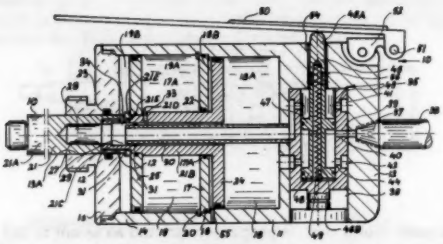
Filed Oct. 26, 1971, Ser. No. 192,220

Int. Cl. F15b *11/16, 13/06*

U.S. Cl. 91—411 A **1 Claim**

This disclosure is directed to a multi piston, double acting, fluid actuated power pack to power various tools between an operative and inoperative position to attain maximum power with limited displacement of the operating piston. This is attained by a power pack comprising of a housing partitioned to define a plurality of piston chambers and having a piston head reciprocally disposed in each of the chambers. The piston heads are connected to a piston rod which is activated between extended and retracted position as fluid pressure is

exerted on the piston heads. Control means in the form of a valve and associated passages are operatively connected to the respective piston chambers for directing the flow of fluid pressure to and from the respective chambers in a manner wherein fluid pressure is applied to each of the piston heads on the power stroke, and on only at least one of the piston heads on the return stroke.



3,752,041

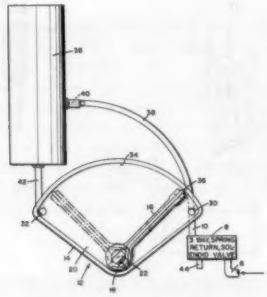
FAIL-SAFE ACTUATOR

Russell G. Smith, Cincinnati, Ohio, assignor to Xomox Corporation, Cincinnati, Ohio

Filed Dec. 6, 1971, Ser. No. 204,990

Int. Cl. F15b *15/12*; F16k *31/12*

U.S. Cl. 91—416 **2 Claims**



A fail safe actuator includes a fluid-operated vane motor, a control valve means connected between a fluid source and one side of the motor, a bypass conduit connected between opposite sides of the motor including a restrictive orifice, and a storage tank cooperating to return the motor to its starting position upon failure.

ERRATUM

For Class 91—485 see:
Patent No. 3,752,053

ERRATUM

For Class 92—37 see:
Patent No. 3,751,988

3,752,042

ADJUSTABLE DIE PLATE

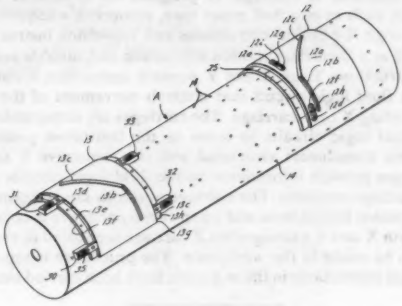
Gerald J. Castille, Houston, Tex., assignor to Castille Cutting Dies, Inc., Houston, Tex.

Filed Oct. 6, 1971, Ser. No. 186,957

Int. Cl. B31b *1/16*; B26d *1/12*

U.S. Cl. 93—58.2 R **14 Claims**

A system of four arcuate dies are adapted to be mounted in evenly spaced threaded holes in a rotary cylinder for a cardboard box fabricating machine. The positions of three of the dies are adjustable either longitudinally or circumferentially, or both, on the rotary cylinder whereby the dimensions of the cardboard boxes manufactured may be varied infinitely.



Further, the position of a single die plate on the rotary cylinder may be adjusted both longitudinally and circumferentially of the rotary cylinder to an infinite number of positions.

3,752,043

STACK FORMING APPARATUS

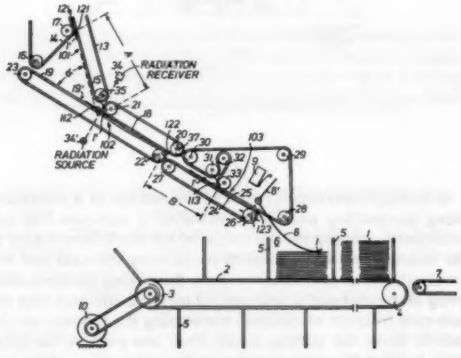
Hans Rapparlie, Konstanz, and Gisbert Burkardt, Reichenau, both of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Germany

Filed June 1, 1971, Ser. No. 148,335

Claims priority, application Germany, May 29, 1970, P 20 26 297.9; May 29, 1970, HGM 70 20 026.9

Int. Cl. B65h *33/12*

U.S. Cl. 93—93 DP **12 Claims**



Apparatus for forming stacks of individual articles from a continuous stream of such articles has a first conveying means for positively conveying flat articles at a predetermined constant speed along a first conveying path. A second conveying means is arranged for positively conveying articles received from the first conveying means along a second conveying path. The inlet of the second conveying means is spaced from the outlet of the first conveying means a distance greater than the length of an individual article. An abutment surface is arranged to extend in the direction of the second conveying path, the first and second conveying paths being arranged at an angle α with respect to one another. The vertex of angle α is on the abutment surface and is arranged adjacent to the input of the second conveying means. Means are provided for selectively moving the articles along the second conveying means at a first predetermined speed and a second predetermined speed less than the first speed. Means are provided for monitoring the stream of articles and sensing the thickness of

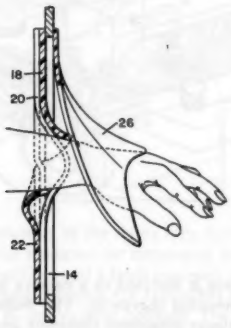
a stack for rapidly switching the means for selectively moving from the first speed to the second speed when a predetermined stack thickness has been reached. This results in articles at the input of the second conveying means overlapping one another and producing a gap in the stream of articles. Means are provided for receiving articles from the second conveying means for forming a stack and for rapidly moving a stack of articles when a predetermined thickness has been reached for the stack.

3,752,044

DAYLIGHT LOADER FOR X-RAY PROCESSOR AND THE LIKE

Ronald Paul Layne, 233 Greystone Ln., Rochester, N.Y.

Filed May 26, 1972, Ser. No. 257,225
Int. Cl. G03d *17/00*
U.S. Cl. 95—1 **4 Claims**



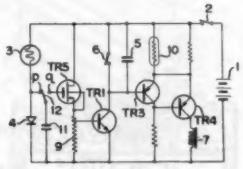
Disclosed is a daylight loader having an opening in adjacent front and side walls. Each opening is covered by four interwoven pieces of one-way stretch fabric, the stretch being oriented in the direction of weave, and a fabric flap hinged to the top of the dark side of each opening covering the entire opening.

3,752,045

ELECTRONIC TIMER CONTROL FOR A SHUTTER

Shigeo Ono, Yokohama-shi, Kanagawa-ken, and Ichiro Hamaguchi, Shinagawa-ku, Tokyo, both of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Continuation of Ser. No. 695,199, Jan. 2, 1968, abandoned. This application Sept. 2, 1970, Ser. No. 69,164
Int. Cl. G03b *7/08*
U.S. Cl. 95—10 CT **16 Claims**



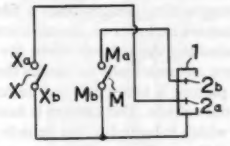
An exposure control arrangement for a camera having an objective lens and a shutter moveable between closed and open positions is disclosed. A light intensity to voltage conversion means is positioned behind the objective lens for converting essentially each value of the intensity of the light passing therethrough during use of the camera to a first voltage having a value essentially linearly proportional to a logarithm of the value of this intensity. The first voltage is selectively stored in a capacitor memory means and switching means are provided for coupling the capacitor memory means to the conversion means during intervals when light passing through the objective lens is incident on the conversion means and for disconnecting the capacitor memory means from the conversion means when light passing through the objective lens is not incident on the conversion means. A timing circuit is coupled to the capacitor memory means. The timing circuit includes a voltage to current conversion means which converts the value of the voltage stored in the capacitor memory means to a current having a value proportional to an antilogarithm of the stored voltage, and also includes a timing capacitor charged by said current. A shutter actuating circuit is operatively coupled to the timing circuit and returns the shutter to said closed position when the timing capacitor is charged to a predetermined voltage.

3,752,046

PHOTOGRAPHIC CAMERA HAVING A FLASH SYNCHRONIZING DEVICE

Masanobu Sato, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sept. 1, 1971, Ser. No. 176,910
Claims priority, application Japan, Sept. 7, 1970, 45/89030; Sept. 8, 1970, 45/89255; Nov. 24, 1970, 45/116564
Int. Cl. G03b *15/03, 9/70*
U.S. Cl. 95—11.5 R **4 Claims**



Photographic camera having a flash synchronizing device operable in X-contact and M-contact synchronization photography. The camera has a pair of electric terminals each connected to the X-contacts and the M-contacts of the flash synchronizing device. The pair of electric terminals are embedded in the accessory shoe of the camera spaced apart from each other in such positions that, when an electronic flash device having an electric contact thereof in its mounting foot is attached to the accessory shoe, the terminal for the X-contacts of the camera contacts with the electric contact of the flash device so as to be operable in X-contact synchronization photography, while, when a flash bulb device is attached with its mounting foot to the accessory shoe, the electric contact provided in the foot contacts with the electric terminal for the M-contacts of the camera so as to be operable in M-contact synchronization photography. Alternatively, the flash bulb device is provided with a movable member adapted to be moved each time a flash bulb is loaded in the flash device so that the movable member cooperates with actuating means in the camera, when the flash device is attached to the camera, for switching a switch of the flash synchronizing device normally connecting X-contacts in the circuit so as to connect the M-contacts in the circuit each time a flash bulb is loaded in the flash bulb device. Two sets of guide number setting resistors are selectively connected across the galvanometer of an automatic exposure control device of the camera having a programming shutter and a flash synchronizing device operable in X-contact and M-contact synchronization photography. One set of the resistors is for the X-contact synchronization while another set is for the M-contact synchronization, and the resistance each of the resistors for the M-contact synchronization is selected to be different from that of the respective resistor for the X-contact synchronization so that the exposure light is compensated for to achieve the proper exposure in the M-contact synchronization in which otherwise underexposure takes place.

3,752,047

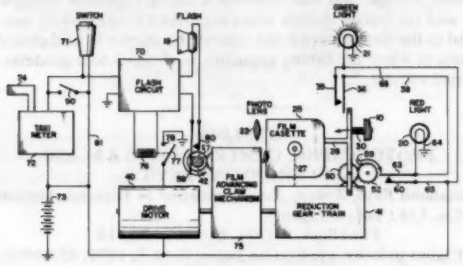
SURVEILLANCE CAMERA

Larry Gordon, 76 Albany Blvd., Atlantic Beach, N.Y., and Larry J. Paskow, 79th St. Causeway, Harbor Island Spa, Miami Beach, Fla.

Continuation-in-part of Ser. No. 72,996, Sept. 17, 1970, abandoned. This application Dec. 13, 1971, Ser. No. 207,225

Int. Cl. G03b *17/46*

U.S. Cl. 95—11 3 Claims



A surveillance camera particularly for use in a moving vehicle such as a taxicab, having a single frame motion picture camera for photographing images onto a film strip in a film cartridge. The camera includes an illumination means, such as a flash, for illuminating the subject when the picture is being taken. The camera automatically advances the film to the next image when the picture is taken and can be remotely actuated by the driver of the vehicle. The camera is housed in a tamper-proof container which is bolted to the vehicle and has indicating lights to signal the readiness of the camera and the remaining film left in its cartridge.

3,752,048

ERROR PREVENTING MEANS FOR FLASH SYNCHRONIZED PHOTOGRAPHY

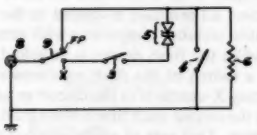
Seijiro Tokutomi, Kanagawa-ken, Fujisawa, Japan, assignor to Asaki Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed June 29, 1972, Ser. No. 267,636

Claims priority, application Japan, July 20, 1971, 46/63470 (utility model)

Int. Cl. G03b *15/02*

U.S. Cl. 95—11.5 R 6 Claims



Error preventing means for focal-plane synchronized camera shutters to inhibit the operation of an electronic flash unit when inadvertently connected to a focal-plane flashbulb outlet, and alternatively for inhibiting the operation of flash bulbs inadvertently connected to an electronic flash outelt, includes a voltage limited short circuiting resistance element which is connected in parallel with a synchronizing switch in the trigger circuit for a flash bulb, and in series with a synchronizing switch of the trigger circuit for an electronic flash unit.

3,752,049

CAMERA APPARATUS HAVING FLASHBULB AND SHUTTER CONTROL

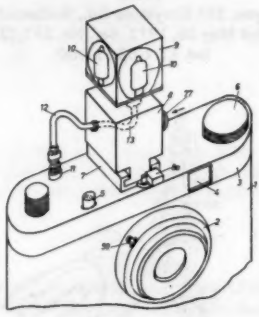
Waldemar T. Rentschler, Calmbach, Germany, assignor to Prontor-Werke Alfred Gauthier GmbH, Calmbach/Schwarzwald, Germany

Filed July 8, 1971, Ser. No. 160,660

Claims priority, application Germany, July 10, 1970, P 20 34 298.7

Int. Cl. G03b *15/04, 9/70*

U.S. Cl. 95—11 L 12 Claims



The invention is directed to a camera having flashbulb attachment connected therewith. The bulbs are ignited by a mechanical trigger associated therewith and tensioning means are secured to the base so that upon release the impact produces ignition of the flashbulb. With the camera there is a shutter arrangement provided with a point of attachment from which the mechanical force necessary for release of the impact member may be obtained.

3,752,050

STILL CAMERA WITH A FILM TRANSPORT SYSTEM

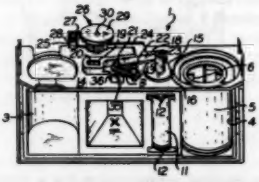
Maynard Frank Wolfe, P.O. Box 20339, Sai Ying Pun, Hong Kong

Filed June 6, 1972, Ser. No. 260,182

Claims priority, application Great Britain, June 7, 1971, 19,305/71

Int. Cl. G03b *1/61*

U.S. Cl. 95—31 FL 7 Claims



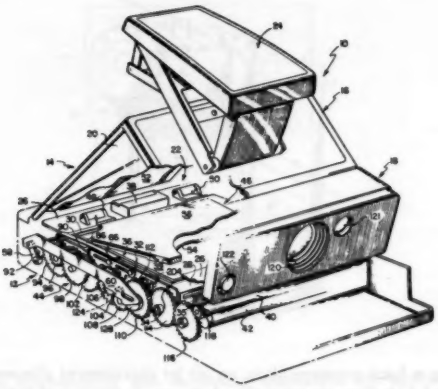
A still camera with a film transport system equipped with a film winding lock that is releaseable independently of the shutter mechanism to present the film for exposure one frame at a time in counted succession.

3,752,051

FILM ADVANCE ACTUATED LATCH FOR REFLECTING MEMBER

Igor Bilnow, Millis, and Robert D. Leduc, Marlboro, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 24, 1972, Ser. No. 247,047
Int. Cl. G03b 19/12
U.S. Cl. 95—42 8 Claims



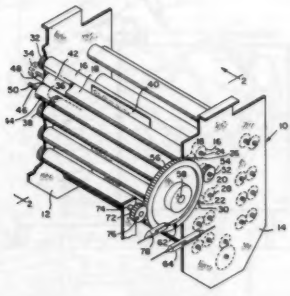
Photographic apparatus of the reflex type having a reflecting member pivotally mounted for movement between viewing and exposure positions and a latch mounted in the path of travel of the reflecting member for releasably retaining the reflecting member in the viewing position. The apparatus is provided with a film-advancing system for (1) moving an exposed photosensitive element out of its exposure position and (2) maintaining the latch in an inoperative position during movement of the reflecting member into the viewing position.

3,752,052

FLUID REPLENISHER CONTROL DEVICE

Henry F. Hope, 195 Welsh Rd., Huntingdon Valley, Pa., and Stephen F. Hope, 2421 Wyandotte Rd., Willow Grove, Pa.

Filed Jan. 3, 1972, Ser. No. 214,814
Int. Cl. G03d 3/02
U.S. Cl. 95—89 R 9 Claims



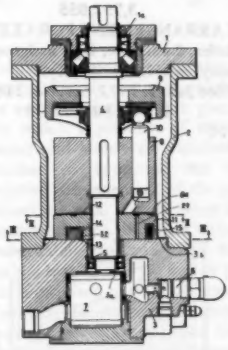
A device for replenisher control suitable for use in automatic web transporting equipment including X-ray and other film developing apparatus. The device includes a pair of rollers which are driven by the web as it passes through the apparatus. One roller is provided with a shaft extension upon which a driving gear is mounted. A large gear which incorporates a switch attracting magnet is responsive to the driving gear and rotates when the web rotates the rollers. The switch attracting magnet functions a timer which precisely controls the operation of a replensiher pump or other apparatus. In the case of film developing apparatus, a replenisher pump is operated through a timed cycle to add additional solutions in proportion to the rate of depletion of the developers and fixers utilized in the film development. The device also includes a signal gear which is responsive to the large gear to actuate a signal circuit for visual indication that a web is passing through the device.

3,752,053

CONTROL PLATE FOR A HYDROSTATIC PISTON MACHINE

Martin Willem Jan Maria Wouters, and Hans Warnke, both of Herne, Germany, assignors to Klockner-Werke AG, Duisburg, Germany

Filed Oct. 27, 1971, Ser. No. 193,121
Claims priority, application Germany, Oct. 28, 1970, P 20 52 878.3
Int. Cl. F04b 1/00
U.S. Cl. 91—485 9 Claims



The control valve plate for a hydrostatic axial piston pump has in its front control face kidney-shaped left and right control ports on opposite sides of an axial plane, and also hydrostatic bearings radially outwards of a circular groove which is located outward of the control ports and communicates with atmospheric pressure. Left and right pressure cylinders and pistons in the rear control face of the valve control plate are located radially outwards of the ends of the left and right control ports, but respectively connected by ducts with the right and members control ports, respectively.

3,752,054

AUTOMATIC PROCESSOR FOR EMULSION COATED METAL TEMPLATES

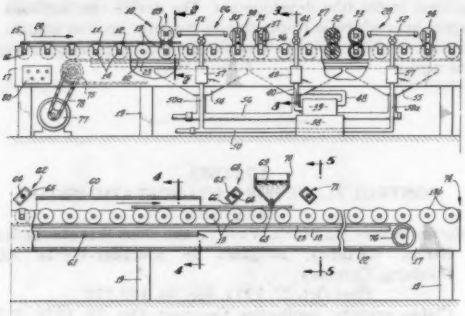
Raymond J. Scanlan, 3029 Gainsborough Dr., Pasadena, Calif.

Filed Mar. 23, 1972, Ser. No. 237,459
Int. Cl. G03d 3/12
U.S. Cl. 95—94 R 6 Claims

Apparatus to develop sensitized emulsion coating on a metallic base sheet comprises:

a. a sequence of sheet conveying rollers rotating to convey the sheet generally horizontally in a forward direction and with the coating exposed vertically,

b. treating means to deliver and direct different liquids into contact with said coating at different stations during sheet forward conveyance,



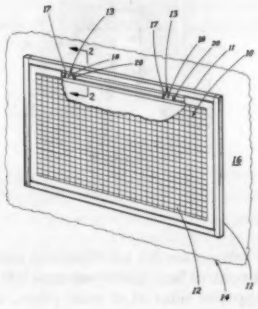
c. and multiple squeegees which are spaced in said direction to engage said coating during said conveyance and to confine said different liquids at said different stations during liquid contact with said coating.

3,752,055

GRILLE ARRANGEMENT FOR CLEAN ROOMS

Bernard R. Shuler, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Jan. 7, 1972, Ser. No. 216,036
Int. Cl. F24f *13/00*
U.S. Cl. 98—114 **6 Claims**



The invention relates generally to clean rooms and relates specifically to a grille and grille securing means construction, particularly adapted for use in clean rooms, wherein the grille securing means comprises at least one magnetic fastener which secures a grille over a duct opening into a clean room.

3,752,056

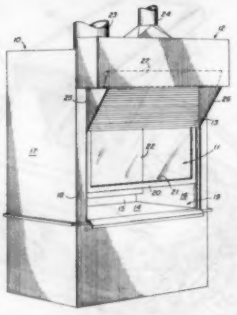
LABORATORY EXHAUST HOOD

Richard I. Chamberlin, Hanover; Joseph E. Leahy, West Quincy, and Frederick J. Viles, Norwood, all of Mass., assignors to E. H. Sheldon and Company, Muskegon, Mich.

Filed Nov. 4, 1970, Ser. No. 86,833
Int. Cl. F23j *11/00*
U.S. Cl. 98—115 LH **22 Claims**

A laboratory exhaust hood is described including in combination a hood superstructure and a novel auxiliary air supply plenum. The auxiliary air supply plenum is of modular design suitable for use wherever an efficient conversion of a relatively high energy air stream of a given cross sectional area to a much lower energy laminar air stream of larger cross sectional area is desired. In particular, the auxiliary air supply is adapted for incorporation with a conventional laboratory exhaust hood, and has exterior vertical front, rear and end walls and a cover and interior baffles which define an air entry chamber, an air slot at the top of said chamber, an expansion chamber extending downward from the slot, an air balance chamber and an air supply outlet. Within the plenum, an air vector controller is positioned between the expansion chamber and the air balance chamber, and the final air balance means, including a back pressure plate, an air jet entrainment eliminator, and a shallow chamber therebetween, is positioned between the air balance chamber and the air outlet.

The combination of the hood superstructure and the auxiliary air supply plenum includes a movable vertical closure sash and immediately above it, when the sash is closed, a sight-tight bypass. Beneath the closed sash is a horizontal air foil for the provision of a flow of air across the work surface of the hood, by the entrainment of room air in auxiliary air jets.

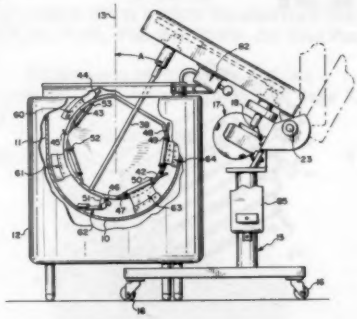


3,752,057

PORTABLE SCRAPER-TYPE MIXER

Frederick H. Groen, Jr., River Forest, Ill., assignor to Dover Corporation, New York, N.Y.

Filed Nov. 2, 1971, Ser. No. 194,868
Int. Cl. A47j *43/07, 43/08;* B01f *7/02*
U.S. Cl. 99—348 **12 Claims**



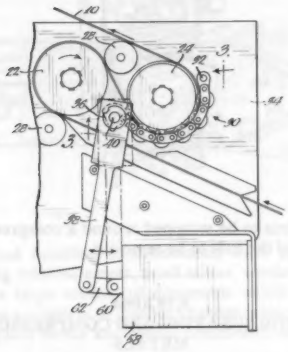
A mixer for a kettle has a shaft extending into the kettle at an angle of 30° with respect to the vertical axis of the kettle. A hoop is attached to the shaft and spaced a uniform distance from the bottom walls of the kettle. Pivotally mounted on this hoop are a plurality of scrapers. These scrapers are at different positions with respect to the walls of the kettle and at different inclinations with respect to the shaft axis. Each scraper is pivotally mounted on the hoop with stops to limit the extent of pivotal movement. Interchangeable scrapers are provided for different mixing operations.

3,752,058

FEED MECHANISM

Peter Lems, Wilmette, Ill., assignor to Signode Corporation, Glenview, Ill.

Filed June 11, 1971, Ser. No. 152,266
Int. Cl. B65b 13/22
U.S. Cl. 100—32 11 Claims



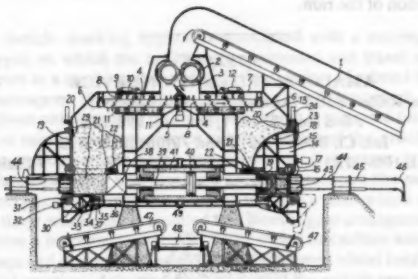
A strap-feeding and tensioning mechanism for applying strap material about an article and tensioning the strap prior to interconnection of the strap loop about the article. The tensioning mechanism consists of a driven wheel that has a friction producing member cooperating therewith to produce frictional engagement between the strap and the peripheral surface of the wheel. The friction producing member is in the form of an arcuate segment that encompasses a substantial circumferential portion of the wheel and is movable between first and second positions to (1) allow unrestricted relative movement between the strap and the wheel and (2) frictionally engage the strap with the periphery of the wheel to cause movement of the strap in response to rotation of the wheel.

3,752,059

METHOD FOR TREATING HOUSEHOLD REFUSE

Jean-Jacques Boyer, 19 Rue Cognacq Jay, Paris, France

Filed Sept. 29, 1971, Ser. No. 184,830
Claims priority, application France, Oct. 6, 1970, 7036035; Sept. 15, 1971, 7133291
Int. Cl. B30b 9/04
U.S. Cl. 100—37 8 Claims



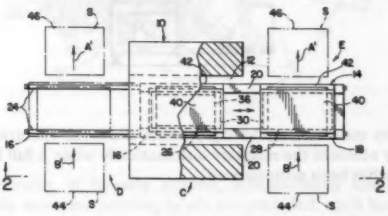
A method of treating household refuse in which the crushed and homogenized refuse is moistened and subjected to a compression in the order of 300 to 500 bars, the material under compression being traversed by perforated tubes for evacuating the liquids to form on the one hand liquid sludges extracted by the bores and on the other hand dry compressed substances. The installation for the treatment of household refuse comprises a storage tank, a device for mixing and homogenising the refuse, and immersion tank, a device for crushing and a press comprising perforated tubes for evacuating the liquids from the compression chamber.

3,752,060

PROCESS FOR DOUBLE PLATEN DENSIFYING PRESS

Joseph B. Hubert, and Bernard K. Hook, both of Hastings, Mich., assignors to Gulf & Western Industrial Products Company, Grand Rapids, Mich.

Filed Jan. 28, 1972, Ser. No. 221,636
Int. Cl. B30b 1/32, 13/00
U.S. Cl. 100—38 8 Claims



A method is disclosed for compressing thin, thermoplastic resin-coated sheets of fibrous material employing a pair of platen assemblies each comprised of a plurality of platen members between which a plurality of sheets to be compressed are disposed and which are relatively displaceable toward one another to compress the sheet material therebetween. Relative displacement of the platen members to compress the sheet material therebetween is achieved in a press having opposed pressing members between which the platen sets are alternately disposed. The method includes loading sheet material into one of the sets of platen members while the latter set is disposed outside the press and the other set is disposed between the pressing members of the press, simultaneously moving the one set of platen members into the press and between the pressing members thereof and the other set of platen members out of the opposite side of the press, closing the pressing members relative to one another whereby the sheet material in the one platen assembly is compressed into the other platen assembly outside the press, simultaneously transferring the one platen assembly back to its initial position outside the press and moving the other platen assembly which is now loaded into the press, closing the pressing members whereby the sheet material in the other platen assembly is compressed, unloading the compressed sheet material from the one platen assembly, and then loading sheets of material to be compressed into the one platen assembly and repeating the alternate loading, pressing and unloading operations of the two platen assemblies. The method further includes heating the platen members of each of the assemblies during loading thereof to melt the resin with which the fiber material is coated, and cooling the platen members of each assembly during the pressing operation to cure the resin.

3,752,061

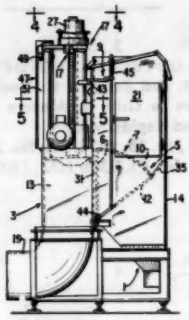
REFUSE COMPACTOR

Stanley Hirsch, Westbury, N.Y., assignor to TCI Inc., Benson, Minn.

Filed June 10, 1971, Ser. No. 151,814
Int. Cl. B30b 15/14
U.S. Cl. 100—49 9 Claims

A refuse compactor suitable for handling a large volume of refuse, such as from an apartment house, in which: a ram is

driven mechanically to apply vertical, high load compaction by means of a jack screw assembly and the refuse is fed to the



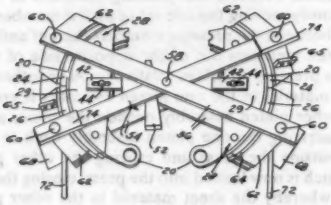
ram by means of a pivoting pushbar platform. Electrical circuitry actuates the machine automatically when a full load of refuse has been accumulated.

3,752,062

APPARATUS FOR BONDING BRAKE LININGS

Thomas E. Morgan, Sr., and Thomas E. Morgan, Jr., both of Detroit, Mich., assignors to Leonard Friedman, Beverly Hills, Calif.

Filed Apr. 30, 1971, Ser. No. 139,005
Int. Cl. B30b *15/04, 15/34*
U.S. Cl. 100—93 PB **21 Claims**



Apparatus for bonding brake blocks to brake shoes, particularly of the type used for large commercial vehicles or military vehicles. A pressure cage utilizes opposed pressure blocks with an apparatus for applying initial pressure in the spreader assembly and opening and closing the pressure assembly to facilitate the insertion of the relatively heavy parts. The apparatus includes automatic equipment for opening and closing the pressure cage as well as applying the pressure for the assembly and subsequent releasing.

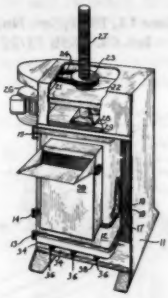
3,752,063

DOCUMENT DESTRUCTION AND BALING MACHINE

Michael Golde, Four Channel Dr., Great Neck, N.Y.

Filed July 13, 1971, Ser. No. 162,223
Int. Cl. B30b *15/08*
U.S. Cl. 100—97 **1 Claim**

A baling machine having a hinged side with a paper shredding mechanism supported thereon to be movable into closed and open positions to form an openable, cylindrical container for receiving and compressing shredded paper and



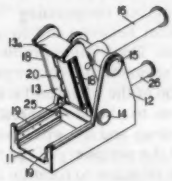
permitting wires to be wrapped around a compressed bale of such paper and the bale to be removed.

3,752,064

MACHINE FOR SHEARING AND COMPRESSING SCRAP METALS

Masao Suzuki, 880 Sezaki-cho, Soka, Japan

Filed June 7, 1971, Ser. No. 150,594
Int. Cl. B30b *15/08*
U.S. Cl. 100—98 R **6 Claims**



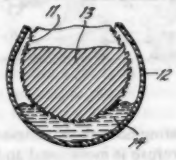
A machine for processing scrap metal having a shear arm rotatably mounted on a machine body and having a drive motor operatively connected thereto for driving the arm relative to the machine body to effect a shearing action on the scrap metal. Cooperatively associated with the shear arm is a driving ram member, to compress the sheared scrap metal into a compact form upon operation of the shear arm. In operation the scrap metal is first caused to be sheared by the operation of the shear arm and then compressed into a compact block by the action of the ram.

3,752,065

AMALGAM TRITURATION DEVICE

Gabriel Reiter, 8204 Ventnor Ave., Margate, N.J.

Filed Nov. 3, 1971, Ser. No. 195,134
Int. Cl. B30b *9/02*; B65d *79/00*; B01f *3/12*
U.S. Cl. 100—123 **7 Claims**



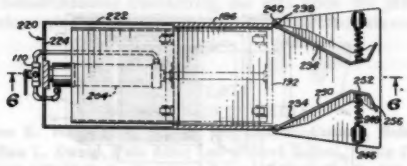
A flexible porous layer to be wrapped tightly about an amalgam to express mercury through the layer, and an impervious layer about the porous layer for containing the expressed mercury.

3,752,066

SOLID WASTE COMPACTOR OPERABLE ON LOW PRESSURE FLUID

Ray E. Charles, 605 W. Mercer Pl., Seattle, Wash.

Filed Apr. 5, 1971, Ser. No. 131,284
Int. Cl. B30b *1/32*
U.S. Cl. 100—192 7 Claims



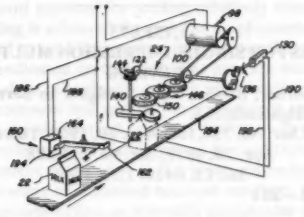
Many food handling establishments such as restaurants, cafes, eating establishments, retail stores, wholesalers and the like have a large volume of disposable solids. In many instances, it is a problem to dispose of these solids. These solids, like corrugated boxes and plastic containers, occupy a large volume.

3,752,067

ARTICLE CONTROLLED ROTARY MARKING APPARATUS

Bernard Gill, Des Plaines, Ill., assignor to Kiwi Coders Corp., Chicago, Ill.

Filed May 10, 1971, Ser. No. 141,600
Int. Cl. B41f *17/26*
U.S. Cl. 101—37 14 Claims



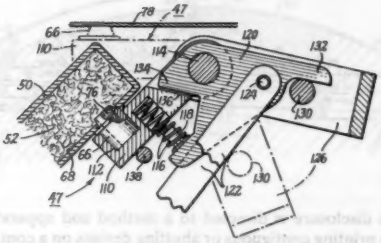
Article marking apparatus associated with a moving conveyor on which the articles are positioned and travel spaced apart to a marking station for the impression of printed indicia thereupon. The apparatus comprises a self contained, motor driven unit arranged on a platform which is mounted for selective raising and lowering to suit the height of the articles. As the article moves along the conveyor, it engages a spring biased swinging arm closing a switch whereupon the motor is energized. The motor is coupled to drive a shaft which carries a timer wheel and is coupled, via a bevel gear arrangement, to drive a marking device. The timer wheel has rollers which engage and disengage a switch arm as the timer wheel rotates. Initial rotation of the timer wheel causes the switch arm to drop one of the rollers and close a circuit to the motor whereby the motor continues to drive the marking device notwithstanding the disengagement of the article from the swinging arm opening the first switch. After a half-revolution, the other roller of the timer wheel engages the switch arm to lift same, opening the associated switch and stopping the motor. In the elapsed time, the marking device is in position to receive the article and the article has arrived at the marking station to receive the impression therefrom.

3,752,068

PRINTING APPARATUS

Herbert Tramposch, Riverside, Conn., and Daniel M. Kabak, Yonkers, N.Y., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Mar. 19, 1971, Ser. No. 125,934
Int. Cl. B41j *27/02, 9/20*
U.S. Cl. 101—93 5 Claims



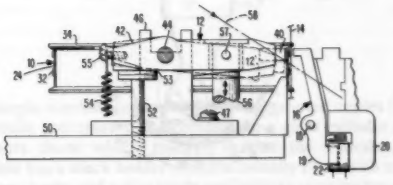
A plurality of linearly aligned, independently selectable, pivotally mounted printing heads are provided, each having a wettable transfer element for transferring a flourescent material in solution from a reservoir to a card being printed. A means for selecting and rotating one or more of the printing heads into contact with a record medium comprises a plurality of pivotally supported elongated lever arms one of which is associated with each head, a linking means for coupling each of said lever arms to said heads for causing rotation of said heads upon movement of an associated lever arm, a means coupled to another segment of each of said lever arms for selectively inhibiting motion of said lever arm about a pivot point thereby inhibiting the rotation of the printing head and a biasing means for applying a force to each of the lever arms for forcing selected printing heads into contact with a card being imprinted.

3,752,069

BACK PRINTER PRINT LINE VISIBILITY CONTROL

Donald J. Stiles, Endwell, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 1, 1971, Ser. No. 158,839
Int. Cl. B41j *1/20, 9/02*
U.S. Cl. 101—93 C 10 Claims

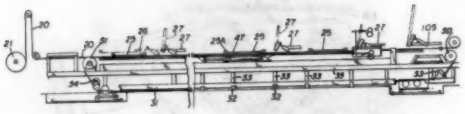


In a back printer print hammers impact the document against type characters formed on upwardly projecting fingers of a steel band. The fingers are backed by a platen which is removable from the print position to permit inspection of the printed information through spaces between the fingers as the band moves along the print line.

3,752,070
METHOD AND APPARATUS FOR SCREEN PRINTING CONTIGUOUS DESIGNS ON ELONGATED STRIPS OF MATERIAL

David Jaffa, Fairlawn, N.J., assignor to Precision Screen Machines Inc., Hawthorne, N.J.

Filed July 20, 1971, Ser. No. 164,296
Int. Cl. B41l 13/14; B65h 29/24
U.S. Cl. 101—123 32 Claims



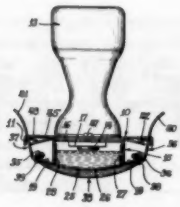
This disclosure is directed to a method and apparatus for screen printing contiguous or abutting designs on a continuous strip of web material. This is attained by cooperatively associating a dryer with the printing screen, whereby the screen and associated dryer are shifted relative to the printed portion of the material as the latter is indexed one repeat in the opposite direction so that the dryer is disposed in heat transfer relationship with the trailing marginal portion of the indexed print to dry the same prior to the repositioning of the printing screen onto the indexed material to effect the next adjacent printed portion; and in which position, the dryer is disposed in heat transfer relationship with the remaining portion of the preceding printed portion to complete the drying of the preceding printed portion.

This invention further contemplates effecting the indexing of the material in the direction of repeat by advancing an endless printing blanket by relative movement of a sectionalized table or by a positive drive of an end roller over which the printing blanket is threaded.

3,752,071
HANDPRINTER CONSTRUCTION

Roderick McKay, Rolling Meadows, Ill., assignor to Weber Marking Systems, Inc., Arlington Heights, Ill.

Filed May 15, 1972, Ser. No. 253,528
Int. Cl. B41l 27/26; B41f 15/00
U.S. Cl. 101—125 2 Claims

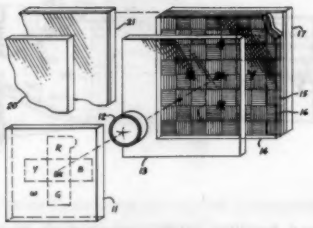


An ink reservoir for a stencil printing rockable hand stamp having a rectangularly shaped shallow container with a flanged perimeter outlining an opening in the container and formed in a single smooth arcuate curve, and a generally rectangularly shaped arcuately curved perforated member arranged for removable snug engagement with the opening of the container.

3,752,072
PROCESS FOR REPRODUCING A FULL-COLOR PICTURE IN ONE IMPRESSION

Leslie H. Lorber, 103 Marlborough St., Boston, Mass.

Continuation-in-part of Ser. No. 754,168, Aug. 20, 1968. This application Apr. 23, 1971, Ser. No. 136,979
Int. Cl. B41m 1/20, 3/00
U.S. Cl. 101—211 11 Claims

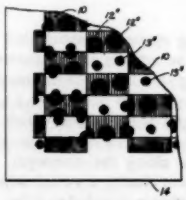


Process of producing an apparent full color print of a multicoloted picture, comprising the steps of: (a) with a composite separation screen having interspersed first and second areas which transmit substantially red and substantially green information, respectively, of the multicolor picture, photomechanically forming upon a printing surface a corresponding composite plate image, the composite plate image being receptive to a substantially neutral tone dark ink; (b) photomechanically forming upon the printing plate, only in the plate portions corresponding to the first areas of the composite separation screen, a substantially cyan plate image of the multicolor picture, the cyan plate image being receptive to a substantially red ink; (c) inking the composite plate image with the dark ink and the cyan plate image with the red ink; and (d) making a single impression of the printing surface upon a receiving substrate having a selected pale color.

3,752,073
PROCESS FOR SINGLE-IMPRESSION MULTICOLOR PRINTING

Leslie H. Lorber, Boston, Mass., assignor to Bernard Olcott, Atlantic Highlands, N.J.

Division of Ser. No. 754,168, Aug. 20, 1968. This application Apr. 26, 1971, Ser. No. 137,688
Int. Cl. B41m 1/20, 3/00
U.S. Cl. 101—211 5 Claims



Process of producing an apparent full color print of a multicolored picture, comprising the steps of:

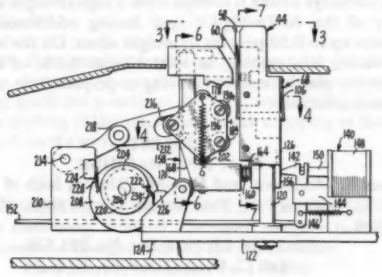
a. by use of a composite separation screen having interspersed 1st and 2nd filter areas which transmit substantially red and substantially green information, respectively, of the multicolored picture, photomechanically forming upon a printing surface halftone printing elements of a composite image having correspondingly interspersed 1st and 2nd information areas respectively for the red and the green information, all of the halftone printing elements being receptive to a dark ink of substantially neutral tone;

b. photomechanically forming field printing elements upon the printing surface only in portions of the surface corresponding to the 1st information areas, the field printing elements providing background to the halftone printing elements occurring within the 1st information areas, the field printing elements being receptive to a substantially red ink;
c. inking the halftone printing elements with the dark ink and the field printing elements with the red ink; and
d. simultaneously transferring the inks upon the printing elements to a receiving substrate of a selected pale color.

3,752,074
CREDIT CARD TERMINAL

James E. White, San Mateo; Quentin E. Correll, Belmont; Allan L. Swain, Palo Alto; Leo Robert Talbot, Santa Clara; Ernest E. Collado, San Carlos, and Tommy A. Oudijk, Palo Alto, all of Calif., assignors to Albert J. Day

Filed Nov. 12, 1970, Ser. No. 88,861
Int. Cl. B41f 3/04; G06k 7/04
U.S. Cl. 101—269 8 Claims



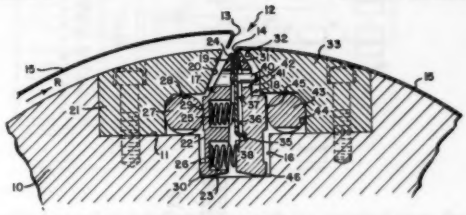
A credit card terminal for reading relatively standard credit cards. Reading is achieved through the employment of sensing pins arranged to read the account number or other special embossments embossed on the card. The pins are independently mounted in close groupings in a block and biased by individual vanes of a common leaf spring. Pin condition is sensed either through means of electical contacts activated by the pins or electromagnetic sensors which change in condition responsive to the movement of the pins. In the preferred embodiment for the direct reading of embossed account numbers, the pins are grouped in groups of five on generally rectangular coordinates so as to achieve a discrete pin condition for each of the numbers zero to nine, inclusive.

The terminal also includes a verifying mechanism to sense the presence or absence of a light responsive verification area on the credit card and a voucher imprinting mechanism to imprint indicia embossed on the card onto a voucher. The principal element of the imprinting mechanism comprises a carriage to receive a card and voucher and maintain the embossments of the card in juxtaposition with the area of the voucher to be imprinted. The basic structure of the imprinting mechanism is completed by a roller positioned to be normally spaced from a voucher and card received within the carriage and a motion imparting mechanism adapted to selectively impart relative motion to the carriage and roller to force the roller into engagement with the voucher and roll the roller relative to the voucher in the area of the voucher to be imprinted. The verifying mechanism comprises a locking device associated with the motion imparting mechanism to normally maintain the mechanism in an inoperative condition and a photoelectric device to sense the presence or absence of a light responsive verification area on a card received in the carriage. Upon the sensing of a valid varification area, the photoelectric device operates in cooperation with the locking device to condition the motion imparting mechanism for operation.

3,752,075
FLEXIBLE PRINTING PLATE CLAMPING DEVICE

Ralph L. Fusco, Commack, N.Y., assignor to Wood Industries, Inc., Plainfield, N.J.

Filed Apr. 26, 1971, Ser. No. 137,200
Int. Cl. B41f 27/12
U.S. Cl. 101—415.1 2 Claims

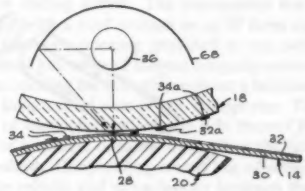


A clamping device for thin flexible printing plates where the device has a plurality of first narrow width plate clamps for clamping the leading edge of a plate, a plurality of second narrow width plate clamps for clamping the trailing edge of the plate, and where the first and second clamps form cooperating pairs of clamps arranged in side-by-side longitudinal assembly in a small shallow axially extending groove on the surface of a plate cylinder of a rotary printing machine. Compression springs are positioned between the clamps of each pair of clamps and a leaf spring blade is held in place on each one of the second clamps by one of the compression springs. A longitudinally extending shaft is provided for each of the plurality of first clamps and of second clamps for opening and closing all of the clamps simultaneously.

3,752,076
METHOD FOR DUPLICATING A PRELIMINARY COPY

Bernard Kaminstein, Paramus, N.J., assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Mar. 12, 1971, Ser. No. 123,632
Int. Cl. B41m 1/06, 5/08
U.S. Cl. 101—450 3 Claims

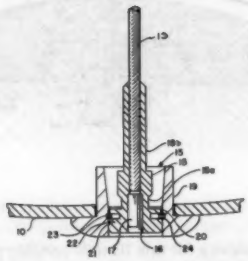


A simple machine for making multiple printed copies from a zinc oxide preliminary copy, including a glass cylinder and a transport drum which presses against the cylinder. The machine has a stack holder which is initially filled with a stack of paper sheets and a zinc oxide preliminary copy on top of the paper sheets. Sheet feeding apparatus first moves the preliminary copy onto the transport drum so it moves between the drum and glass cylinder to heat the dark areas on the preliminary copy which represent the image, so that these image regions are transferred to the glass cylinder. Inking rollers then apply ink to the image areas on the cylinder while successive sheets of paper to be printed upon are fed between the roller and glass cylinder.

3,752,077
RELEASE CONNECTOR FOR A RISER OF A PARACHUTE FLARE

Henry J. Roberts, Ogden, and Willard F. Davis, Brigham City, both of Utah, assignors to Thiokol Chemical Corporation, Bristol, Pa.

Filed June 4, 1970, Ser. No. 43,331
Int. Cl. F42b *13/38*
U.S. Cl. 102—35 2 Claims

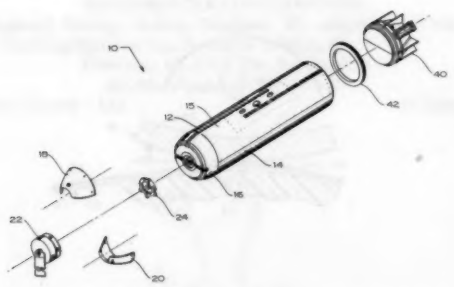


In association with parachuted illuminating flares, an improved riser to flare connector is provided which automatically releases one or more of the parachute risers to spill air out of the parachute when the flare is spent and thus causes the empty container to drop. The connector separates automatically at a predetermined temperature and is explosively operated. Also, the connector is easily and quickly assembled to the flare since it includes a plug and a socket into which the plug fits with a "snap-in" action.

3,752,078
DISPENSER CARGO SECTION

Craig L. Stump, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 21, 1972, Ser. No. 219,774
Int. Cl. F42b *25/16*
U.S. Cl. 102—7.2 4 Claims



An aerial delivery carbo dispenser is provided for attachment to aircraft stores stations. Top and bottom half sections are welded together and fastened to a forward bulkhead and an after fairing. The top and bottom half sections are extruded with an integral longitudinal holder portion along one side designed to contain a linear shaped charge, for example. The top half also has an integral strong back portion for attachment strength and stability. The forward bulkhead is fitted with a linear shaped charge shield comparable to the housing along the two half portions and connects thereto so that a linear shaped charge may be used to cut along both side sections and through the forward bulkhead.

3,752,079
METHOD FOR FIGHTING DUST AND NOXIOUS GASES AFTER BLASTS IN MINES

Hans Lewer, Witten-Annen, Germany, assignor to Chemische Fabrik Kalk Gmb H.

Filed July 1, 1970, Ser. No. 51,735
Claims priority, application Germany, July 3, 1969, P 19 33 729.2
Int. Cl. F42d *1/08*
U.S. Cl. 102—30 6 Claims

Finely-divided calcium chloride and/or magnesium chloride are employed to suppress and remove dust and noxious gases generated during blasting by sealing the blast-holes with these salts.

3,752,080
CARTRIDGE CASE

Rolf Friederich Weyhmuller, Greifensee, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG, Zurich, Switzerland

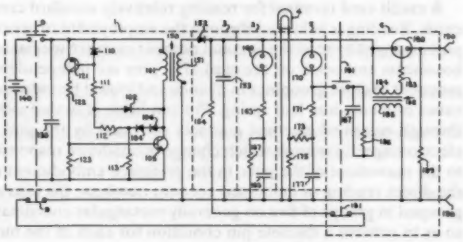
Filed June 9, 1970, Ser. No. 44,896
Int. Cl. F42b *5/26*
U.S. Cl. 102—43 R 2 Claims

A cartridge casing is formed from a high strength aluminum alloy of the Al-Zn-Mg-Cu type having additionally added thereto up to 0.50 percent by weight silver. On the interior of the casing is a coating, at least 30 μm thick, of an elastic synthetic plastic material having a polyethylene or polyurethane precursor.

3,752,081
BLASTING MACHINE

James E. McKeown, and Earl M. Phinney, both of Oneonta, N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Nov. 23, 1971, Ser. No. 201,526
Int. Cl. F42b *3/18, 3/12, 3/10*
U.S. Cl. 102—70.2 R 14 Claims



A blasting machine for firing an explosive bridge wire device or the like. The firing circuit of the apparatus includes a trigger pulse generating circuit that does not generate trigger pulses until the energy being stored in a capacitor to be discharged through explosive devices has reached a predetermined energy level, thereby preventing firing of the explosive devices before there is sufficient energy stored in the capacitor to assure that all the devices in circuit relationship with the capacitor are detonated. The charging circuit includes a battery powered blocking oscillator and a step up transformer for transforming the energy from a 12 volt battery to a 2,500 volt storage capacitor.

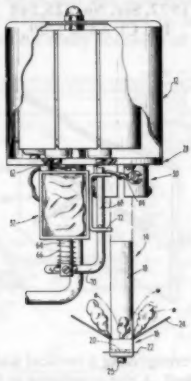
3,752,082
FLARE DISPERSING AND IGNITING APPARATUS

George L. Kernan, 2567 Fraser Ct., Pinole, Calif.

Division of Ser. No. 866,534, Oct. 15, 1969, Pat. No. 3,628,416. This application June 1, 1971, Ser. No. 148,936
Int. Cl. C06d *1/04, 1/10*
U.S. Cl. 102—37.8 7 Claims

An apparatus adapted to be supported on a vehicle for storing an ignitable safety flare, dispensing the flare to deposit the

same on the road, and in the process of dispening the flare causing the same to be ignited. In one embodiment of the invention a plurality of flares are stored in a rotatable turret or magazine. The latter is rotatable to position sequential flare at a discharge station with a metal conductor pin extending



through the flare serving as the sole support for the flare. Sending an electrical current through such a pin causes the pin to heat up, ignite the powder in the flare, and simultaneously, due to the melting of the pin, results in the dropping of the ignited flare from the storage magazine.

3,752,083

LOCOMOTIVE BOGIE HAVING LIFTING DOGS

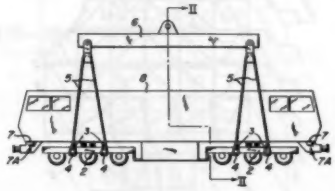
Friedhelm Bitterberg, Fuldatal, Germany, assignor to Rheinstahl Henschel Aktiengesellschaft, Kassel, Germany

Filed Jan. 29, 1971, Ser. No. 110,890

Claims priority, application Germany, Jan. 31, 1970, P 20 04 416.0

Int. Cl. B61d *49/00*; B61f *5/50*; B66c *1/20*

U.S. Cl. 105—1 A **1 Claim**



A bogie equipped locomotive in which the vehicle box normally rests on the pertaining bogies, and in which said bogies only are provided with lifting dogs for lifting said bogies and said vehicle box as a unit.

3,752,084

AUTOMATIC OPERATION CONTROL DEVICE OF AN AUTOMOTIVE VEHICLE

Pierre Riondel, Geneva, Switzerland, assignor to Societe Anonyme des Ateliers de Secheron, Geneva, Switzerland

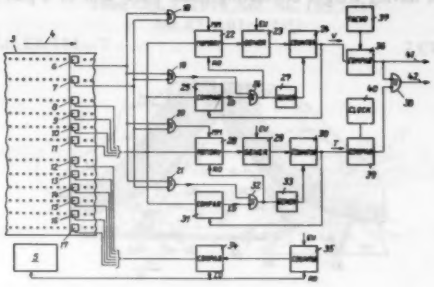
Continuation-in-part of Ser. No. 21,385, March 20, 1970, abandoned. This application May 18, 1972, Ser. No. 254,539

Claims priority, application Switzerland, Apr. 23, 1969, 6187/69

Int. Cl. B60l *15/22*

U.S. Cl. 105—61 **1 Claim**

An automatic operation control device for an automotive vehicle rolling along a given trail. A data registering member stores parameters relating to the maximum permissible speed as a function of the distance travelled, and parameters relating to the required time interval as a function of the distance travelled. Means are provided for reading these two sets of data. Comparator means compare the real speed with the



required speed and the real time with the required time, for controlling the traction and braking means of the vehicle.

3,752,085

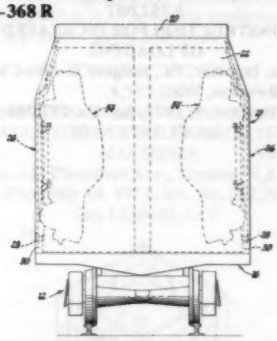
VEHICLE TRANSPORTER

Anthony Venditty, Fraser, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 879,659, Nov. 25, 1969, abandoned. This application July 8, 1971, Ser. No. 160,946

Int. Cl. B60p *7/08*; B61d *45/00*

U.S. Cl. 105—368 R **2 Claims**



A wheeled transporter supporting a plurality of vehicles in a vertical position during transit. The transporter has a base frame connected with a roof portion so as to form an enclosure having at least one opening provided in one side of the transporter. A door has one end thereof hingedly connected to the frame in the opening for movement about a horizontal axis parallel to the longitudinal axis of the transporter. The door includes a pair of tracks formed on one side thereof for guiding the wheels of a vehicle onto the door when the latter is in the lowered position. Cooperating means are attached to the underside of the vehicle and to each door between the tracks for automatically locking the vehicle on the door when the vehicle is driven on the door with its wheels in the tracks.

3,752,086

STOWABLE FREIGHT RESTRAINING APPARATUS

Chester A. M. Smith, R.R. No. 1, Cumberland, Ontario, Canada

Filed Jan. 26, 1972, Ser. No. 220,793

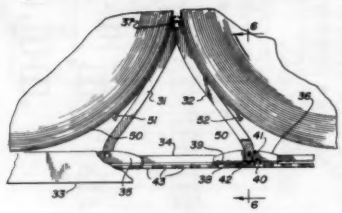
Claims priority, application Canada, Feb. 16, 1971, 105,495

Int. Cl. B60p *7/12*; B61d *45/00*

U.S. Cl. 105—369 B **7 Claims**

A freight restraining apparatus for a freight transporting vehicle which can be stowed within the wall of the vehicle when not in use. In the preferred embodiment a number of the restraining apparatuses are positioned within a railway freight car to restrain the movement of newsprint rolls or other cylin-

drically shaped lading to prevent inertial forces from causing a large number of rolls to gang up and crush those near an end wall. The restraining apparatus comprises a pair of restraining arms having freight contacting pads. Each arm of a pair is

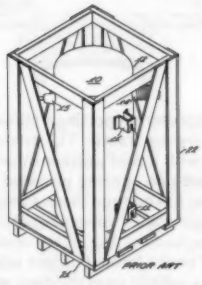


pivotally attached to a carrier member adjustably mounted in a guideway secured to the vehicle wall. The other ends of each pair of arms are connected together by means of a removeable pin.

3,752,087
PALLET CONSTRUCTION FOR INCREASED DENSITY OF LOADING

Albert J. Finke, Ingomar, Pa., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 9, 1971, Ser. No. 197,054
Int. Cl. A47b *57/00*
U.S. Cl. 108—59 **27 Claims**

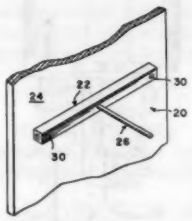


A pallet structure for the simultaneous fork truck loading of a plurality of devices having projecting components on a truck trailer bed. Each device is secured to a skid sized so that a whole number of skids occupy the width of the trailer bed. A plurality of skids are nested on a master pallet with the projecting components of adjacent devices in interfitting relation. The plurality of skids are nested within skid receiving pockets on the master pallet so that adjacent skids abut, and cooperating surface means on the master pallet and on each skid prevent horizontal and vertical displacement of the skid relative to the master pallet, thereby permitting fork truck handling of the master pallet carrying a plurality of skids without danger of dropping one of the devices, reducing the number of trips required to load the trailer bed, and minimizing empty cargo space on the trailer bed.

3,752,088
SHELF ASSEMBLY

Bertram H. Kapnek, 8106 Douglas Rd., Philadelphia, Pa.

Division of Ser. No. 815,567, April 14, 1969, Pat. No. 3,642,238, which is a continuation-in-part of Ser. No. 720,617, April 11, 1968, Pat. No. 3,527,175. This application Feb. 14, 1972, Ser. No. 225,748
Int. Cl. A47b *5/00*
U.S. Cl. 108—152 **2 Claims**

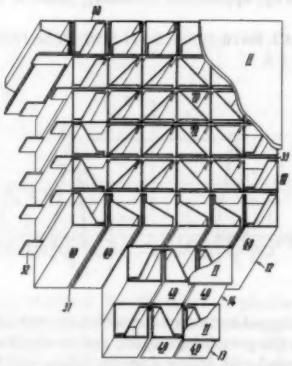


A shelf assembly comprising a vertical wall and a supporting bar secured to the wall. A rod is secured in the supporting bar, and the rod serves to support a shelf on the wall. The rod is received in a channel in the shelf.

3,752,089
LOAD BEARING STRUCTURE

Friedrich Bartels, Via Baraggie 3, Ascona, Switzerland

Filed Sept. 20, 1971, Ser. No. 181,814
Claims priority, application Germany, Sept. 28, 1970, P 20 47 611.3
Int. Cl. A47b *13/00*
U.S. Cl. 108—161 **17 Claims**



A load bearing assembly comprising a horizontal platform mounted on a sub-structure, said sub-structure comprising a plurality of vertical hollow units, each unit comprising a rectangular sheet of substantially rigid material scored along longitudinal lines into rectangular sections and folded and joined to form a box tube unit.

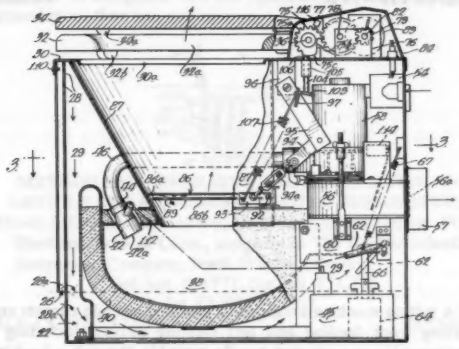
3,752,090
DRY SANITARY TOILET

Donald P. Frankel, Lake Geneva, and Charles K. Peterson, Fontana, both of Wis., assignors to La Mere Industries, Inc., Walworth, Wis.

Filed Jan. 20, 1971, Ser. No. 108,050
Int. Cl. A47k *11/02*
U.S. Cl. 110—9 R **51 Claims**

An incinerating waste disposal plant is provided in the form of a dry sanitary toilet with a cooling air passage or jacket

between the combustion zone and the outer wall of the cabinet for cooling the device during a cooling cycle. The exhaust blower has an inlet chamber at its intake and a variable vent valve which controls draft of air through the cooling air passage. A hopper in the toilet has side walls supporting a trap door between the toilet seat and a receiving and combustion chamber and the walls are secured to and supported by a removable top deck for ready access to all operating elements



within the device for repair purposes. A gas burner having a spark gap igniter is used to supply flame to the receiving and combustion chamber. The exhaust blower can be replaced or supplemented by a venturi exhaust system which is especially useful in adapting the device for use on a diesel locomotive for using the available fuel and air supplies. In one form, all electrical components except the igniter are mounted in a separate top cabinet which also provides a back rest for the seat.

3,752,091

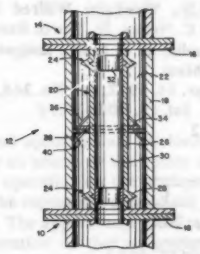
SECTIONALIZED STACK

Eillen M. Lawrence, 22 Glenwood Rd., Roslyn, N.Y.

Continuation-in-part of Ser. No. 27,355, April 10, 1970, Pat. No. 3,669,042. This application May 10, 1972, Ser. No. 252,083

Int. Cl. F23j *11/00*

U.S. Cl. 110—184 **5 Claims**



A sectionalized stack in which each vertical section has outer and inner upright walls and annular, horizontal flanges connecting the upper and lower ends of the walls to bound an air-filled, insulating chamber is provided with two accordion-like circumferential folds in the inner wall adjacent the respective flanges. The inner wall has a main portion of uniform cross section connecting the folds. The folds being somewhat resilient, the connecting portion can expand vertically and horizontally at a rate different from the rate of expansion of the outer wall when very hot gases rise in the conduit bounded by the inner wall. Distortion of the folds by the weight of the connecting portion is prevented by transferring most of the weight of the connecting portion to the outer wall by means of slidably engaged abutments on the two walls in the insulating chamber.

3,752,092

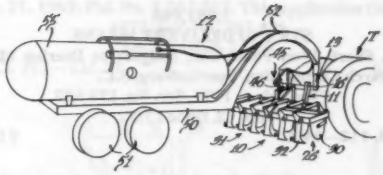
SOIL WORKING APPARATUS

H. Owen Vinyard, Rt. 2, Box 75A, Hammond, La.

Filed Oct. 1, 1971, Ser. No. 185,731

Int. Cl. A01c *23/02*

U.S. Cl. 111—7 **2 Claims**



Soil working apparatus including a frame equipped with soil working means which is mounted on the lifting arms of a tractor so that the arms may lower the soil working means t0 engage the soil or may lift the soil working means clear of the soil, and a trailer carrying auxiliary means that cooperates with the soil working means, the trailer having a gooseneck hitch that connects pivotally to the tractor forward of the lifting arms and that is of sufficient length and height to span the frame from front to rear and clear the frame in all positions of the lifting arms, and to clear the ends of the frame when the tractor is turned at a right angle to the trailer. Particularly, the soil working apparatus is an ammonia applicator and the auxiliary means is a tank of liquid ammonia.

3,752,093

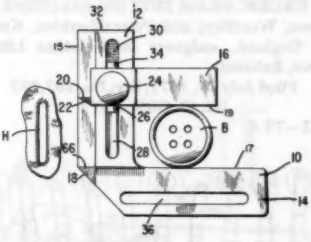
BUTTONHOLE GAUGING GUIDE ATTACHMENT ESPECIALLY FOR USE WITH DOMESTIC SEWING MACHINES

Karl Loeffler, 323 Clearfield Ave., Trenton, N.J.

Filed July 14, 1971, Ser. No. 162,589

Int. Cl. D05b *3/06*

U.S. Cl. 112—75 **2 Claims**



A buttonhole gauging guide device is herein provided which is particularly adapted for use with domestic sewing machines. An L-shaped base member presents two legs extending mutually perpendicular with respect to each other. A first leg is provided with a slidable gauging arm which is movable toward the second leg and is supported to maintain parallel relationship therewith. The gauging arm is formed with a clamping portion extending in the plane of the second leg. The arm is further provided with an indicator projection which cooperates with an indicator marking on the base member to display, to a sewing machine operator, the necessary buttonhole length for a button disposed between the arm and the L-shaped base. The slidable gauging member may be spring biased toward the second leg of the base. The first leg may be formed with a raised track-like portion which may be of a hollow configuration to slidably support a guiding member. A

threaded fasteneing means may be inserted through an aperture formed in the gauging arm to connect the gauging arm with the aforementioned guiding member supported within the raised track-like portion of the base.

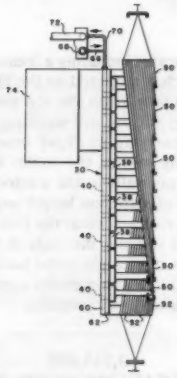
The second leg of the base may be formed with an elongated slot for adjustably mounting the overall device to virtually any existing, conventional, domestic sewing machine.

3,752,094

STRAND DELIVERY MEANS

Joe T. Short, West Point, Ga., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed July 6, 1971, Ser. No. 159,632
Int. Cl. D05c *15/32*
U.S. Cl. 112—79 A **9 Claims**



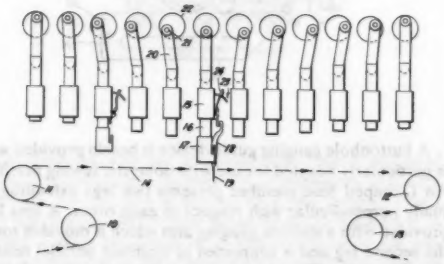
Apparatus for feeding strands of material to a plurality of closely positioned strand take-up means comprising separate strand-engaging advancing means for each takeup means positioned in closely adjacent rows, with guide means extending between adjacent rows for guiding a strand to and from each advancing means to its corresponding takeup means.

3,752,095

CYCLIC BEAM TUFTING MACHINE

Philip Brown, Wembley, and Peter Hawkins, Kingston Hill, both of England, assignors to Keystone Limited, New Providence, Bahamas

Filed July 29, 1971, Ser. No. 167,093
Int. Cl. D05c *15/12*
U.S. Cl. 112—79 A **11 Claims**



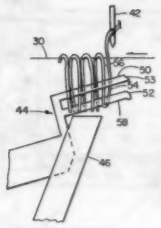
A tufting machine has a number of rows of needles, one row for each yarn colour to be tufted, and individual reciprocating beams for each row for driving the needles into a backing to tuft. Each needle can be individually latched to its associated beam in accordance with a programmer so that a predetermined pattern can be formed from the yarn tufts on the backing. The beams are reciprocated in a cycle so that at any one time the needles of at least one beam are engaged in the backing.

3,752,096

LOOPER AND METHOD FOR PRODUCING CUT PILE TUFTS

Helmut C. Mueller, Springfield, Mass., assignor to Bigelow-Sanford, Inc., Thompsonville, Conn.

Continuation-in-part of Ser. No. 72,004, Sept. 14, 1970, abandoned. This application Apr. 28, 1971, Ser. No. 138,156
Int. Cl. D05c *15/22*
U.S. Cl. 112—79 R **9 Claims**



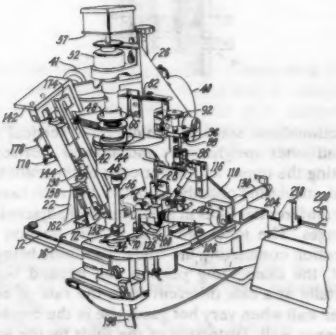
A tufting machine arranged to produce cut pile carpets and having work feeding and tuft forming devices including a reciprocable eye-pointed needle movable through a backing for the carpet between retracted and extended positions, has a double looper with a lower bill and an upper bill off-set from the lower bill. When the looper advances, the upper bill passes entirely outside the loop formed by the projecting needle so that a single long loop is formed around the lower bill only in each succeeding loop-forming cycle. In a tufting machine arranged to produce relatively dense "U"-cut pile tufts, the single long loop around the lower bill is deformed, and a yarn severing knife severs the yarn adjacent the lower edge of the lower bill to produce cut pile of a substantially uniform length. In a tufting machine arranged to produce high shag carpets, a yarn severing knife cooperates with the upper bill to cut one leg of the needle loop adjacent the bottom edge of the upper bill, thereby forming a short pile length and a much longer pile length to produce a pronounced "J" cut pile tuft.

3,752,097

FABRIC EDGE FINISHING MACHINES

George A. Fuller, Jr., Wenham; Wilfred Louis Langevin, Beverly; Geoffrey C. Nelley, Jr., North Reading, and Ole B. R. Pearson, Magnolia, all of Mass., assignors to USM Corporation, Boston, Mass.

Filed Apr. 14, 1972, Ser. No. 244,217
Int. Cl. D05b *27/14*
U.S. Cl. 112—121.12 **14 Claims**



Mechanism is provided for enabling an overedging or other edge-treating machines automatically to operate progressively about the periphery of successive flexible work pieces, espe-

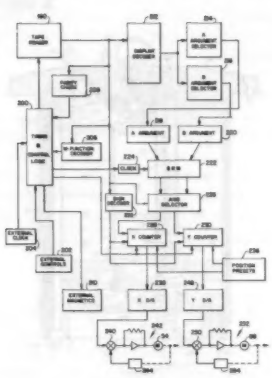
cially those of fabric having margin configuration including portions of constant convex curvature. Several improvements and refinements relating, for instance and without limitation, to automatic corner turning, to marginal label securement in the course of each operating cycle, so called sewing-off near the end of the cycle, "kickout" of the work piece from the operating zone, and associated thread cutoff, all contribute towards increasing productivity and relieving burden on an operator to the extent that the operator may simultaneously attend more than one machine.

3,752,098

METHOD AND APPARATUS FOR TRANSLATING AN ARTICLE AND A TOOL RELATIVE TO ONE ANOTHER

David J. Logan, Glastonbury, and Heinz Joseph Gerber, West Hartford, both of Conn., assignors to The Gerber Scientific Instrument Company, South Windsor, Conn.

Filed Apr. 5, 1971, Ser. No. 131,285
Int. Cl. D05b *21/00*
U.S. Cl. 112—121.12 **25 Claims**



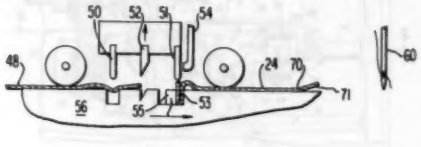
A method and apparatus are disclosed for moving relative to one another an article or workpiece and a tool which performs a cyclic operation on the workpiece so that the cyclic operation can be repeatedly carried out at different points on the workpiece. The apparatus and the method which comprehends the operation of the apparatus are particularly addressed to a numerically controlled sewing machine in which an article to be sewn and a reciprocating sewing needle are translated relative to one another according to a plurality of vector commands which individually define the direction and length of each sewing stitch and together define a desired path or seam along which the sewing stitches are formed. The article is supported on a translatable carriage and the movements of the carriage relative to the sewing needle are controlled by a pre-programmed memory tape. The memory tape is programmed with coded digital information defining the vector commands and other machine function commands and has the information defining the vector command for each stitch contained entirely within a single tape frame. The movements of the article and translatable carriage are executed in response to and in synchronism with the cyclic operation of the sewing needle and may occur during the phase of the cyclic operation in which the needle is withdrawn from the article being sewn.

3,752,099

SYSTEM OF MAKING WAISTBANDS WITH CRIMPED BELT LOOPS, LABELS AND TICKETS

John P. Hunter, Jr., Dunwoody, and Erle George Huddleston, Monroe, both of Ga., assignors to Oxford Industries Inc., Atlanta, Ga.

Division of Ser. No. 097,489, Dec. 14, 1970, Pat. No. 3,710,398, which is a continuation-in-part of Ser. No. 851,986, Aug. 21, 1969, Pat. No. 3,562,817. This application Oct. 13, 1972, Ser. No. 297,476
Int. Cl. D05b *23/00*
U.S. Cl. 112—121.27 **6 Claims**



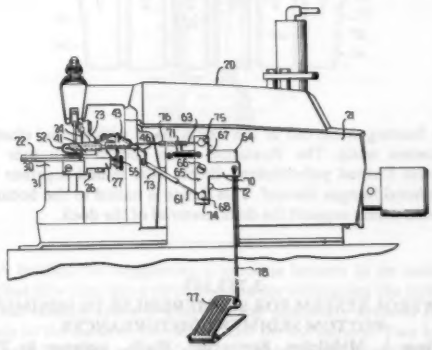
A method of making waistbands for pants and other garments wherein a series of waistband panels are joined together in end-to-end relationship to form a continuous series of waistband panels, a continuous band of facing material is fed into abutting relationship with one edge of the series of panels and is continuously rocaped to the series of panels. The panels are marked and belt loop material is fed in a continuous strip toward the panels, cut to proper length, the lengths are crimped and folded at their ends and sewn to the panels in positions corresponding to the markings. Labels are sewn to the facing material at positions corresponding to the ends of the panels, sales tickets are basted to waistband panels, the panels are separated and the facing material is cut at positions adjacent the ends of the waistband panels alternately with a straight cut extending across the facing material and with a Y-shaped cut to remove a portion of the facing material.

3,752,100

HEM FOLDING ATTACHMENT

James E. Sharp, Chicago, Ill., assignor to Union Special Machine Company, Chicago, Ill.

Filed Oct. 20, 1971, Ser. No. 190,802
Int. Cl. D05b *35/02*
U.S. Cl. 112—143 **14 Claims**

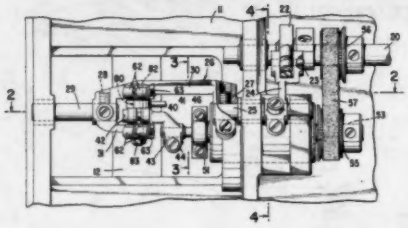


This disclosure relates to a hem folding attachment for the sewing machine which includes first and second folder sections individually movable between operative and open positions and cooperative with a fixed edge guide, the attachment being readily adaptable to existing sewing machines and being selectively manually and power actuated.

3,752,101
LOOPER CARRIER BEARING FOR CHAINSTITCH SEWING MACHINES

Heinrich Ciecior, Ettlingen, Germany, assignor to The Singer Company, New York, N.Y.

Filed Aug. 9, 1972, Ser. No. 278,907
Int. Cl. D05b *1/10*; F16c *9/06*
U.S. Cl. 112—200 **3 Claims**

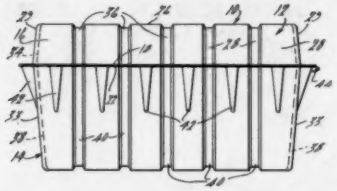


A bearing construction is disclosed for a four-motion thread-carrying looper mechanism of a chainstitch sewing machine which requires only simple machining of the major parts of the looper mechanism to moderate dimensional tolerances and which utilizes a pair of bearing assemblies which are inserted and clamped into the mechanism and adjusted selectively for optimum axial and radial clearance.

3,752,102
FLOATING DOCK OR THE LIKE AND FLOATATION UNIT FOR USE THEREWITH

Robert A. Shuman, Plymouth, Mich., assignor to Woodall Industries Inc., East Detroit, Mich.

Filed Sept. 22, 1971, Ser. No. 182,744
Int. Cl. B63b *35/00*
U.S. Cl. 114—.5 F **14 Claims**



A floating dock, raft or the like is made with special plastic floatation units. The floatation units consist of a pair of vacuum formed polyethylene sheets heat sealed together at peripheral flanges thereof. This flange is nailed to the bottom of joists which support the deck material of the dock.

3,752,103
CONTROL SYSTEM FOR SUBMERSIBLES TO MINIMIZE BOTTOM SEDIMENT DISTURBANCES

William A. Middleton, Bremerton, Wash., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

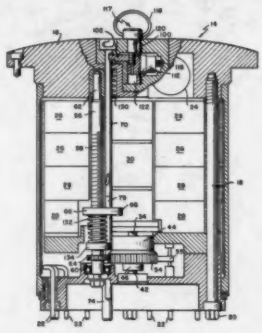
Filed Jan. 24, 1972, Ser. No. 220,025
Int. Cl. B63g *8/16*
U.S. Cl. 114—16 R **5 Claims**

A steerable propulsion system for maneuvering a submarine vehicle in close proximity to the bottom of a body of water with minimal disturbance of the bottom material includes a series of four thrust producers spaced about the center of buoyancy of the submarine vehicle. Controls limit the direction of thrust application to prevent the water flow produced by the thrust producers from impinging upon the bottom.

3,752,104
TORPEDO SAFE SEPARATION AND ARMING MECHANISM

Roger W. Haushalter, Santa Barbara, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 6, 1971, Ser. No. 187,133
Int. Cl. F42b *19/01*; F42c *15/00*
U.S. Cl. 114—20 R **9 Claims**



A mechanism for arming a torpedo only after the torpedo achieves a safe separation from the launching tube including an elongate rod which is electrically driven from within the torpedo and caused to extend beyond the surface of the torpedo body by an upwardly moving threaded member mounted on a rotating threaded shaft. Should the torpedo inadvertently become lodged within the launching tube the rod jams the mechanism thereby preventing the torpedo from becoming armed. If the torpedo has successfully exited from the launching tube, after the tube sensing operation is completed, another elongate rod is withdrawn from the arming device by the same upwardly moving threaded member thereby unlocking the same. After a predetermined delay, the arming device is electrically connected to the firing circuit.

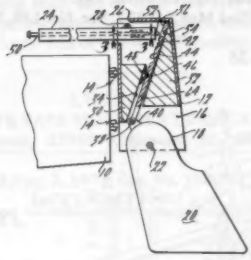
3,752,105
RUDDER CONSTRUCTION FOR SAILBOATS

Richard L. Hackett, Lincoln Pl., Petoskey, Mich.

Filed July 6, 1971, Ser. No. 159,802
Int. Cl. B63h *25/06*
U.S. Cl. 114—162 **5 Claims**

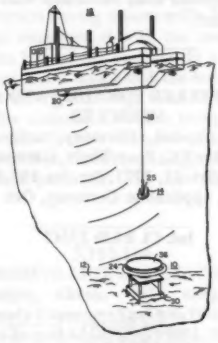
A rudder construction for small boats, particularly sailboats, in which the rudder is mounted on its rotatable support frame for pivotal movement on a horizontal axis to prevent

damage to the rudder in the event that it strikes an obstruction in the water. A detent means yieldably retains the rudder in its



normal vertical position or a horizontal or intermediate position. The tiller may be manipulated to move the rudder to any of said positions.

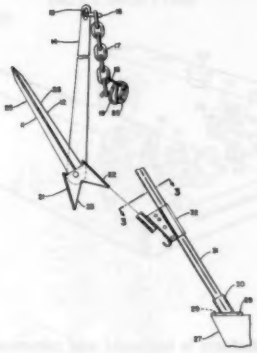
3,752,106
MOORING SYSTEM
Philip M. Chen, Washington, D.C., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Dec. 1, 1971, Ser. No. 203,671
Int. Cl. B63b *21/52*
U.S. Cl. 114—206 R **11 Claims**



A light-weight anchoring device is lowered through the water to an anchor station on the bottom. The anchoring device includes a plurality of fluke members which are movable against the action of a spring, and include latching surfaces. The anchoring device is lowered through an aperture in the anchor station which causes the flukes to compress against the action of the spring and thereafter expand once the latching surfaces are past the aperture, to thereby latch on to the bottom station. A mooring line extends from the anchoring device to a surface buoy and retrieval is accomplished by sending a weighted messenger down the mooring line to compress the flukes together so that withdrawal from the aperture may be effected.

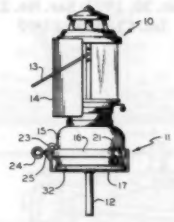
3,752,107
MOUNT FOR A TWIN-FLUKE TYPE ANCHOR
David H. Van Tuyl, 580 Araseradero, Palo Alto, Calif.
Filed Oct. 20, 1971, Ser. No. 190,924
Int. Cl. B63b *21/22*
U.S. Cl. 114—210 **4 Claims**

A mount for an anchor of the twin-fluke type disclosed wherein the anchor includes an elongated stock integrally connected to the flukes and an elongated shank pivotally connected to the stock between the flukes. The anchor further includes a pair of flat crown plates, each plate connected to the stock between the flukes and spaced outwardly on opposite sides of the plane of the flukes and sloping inwardly toward the plane of the flukes so as to permit bottom to flow freely between the flukes and the underside of the respective crown plates when the anchor is resting on the bottom of a body of water. The mount is mounted on an upstanding portion of a



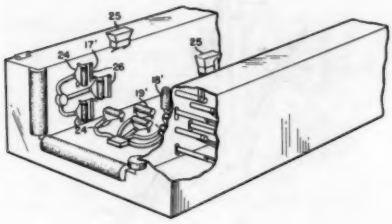
vessel, such as a stanchion, with the stanchion extending upwardly at an angle of about 90° or less from the horizontal. The mount includes a crown plate support thereon for receiving one of the crown plates of the anchor therein and retaining the plate at an angle such that the plane of the flukes is generally parallel to the longitudinal axis of the stanchion when one of the crown plates of the anchor is mounted in the crown plate support.

3,752,108
ADJUSTABLE LANTERN BRACKET FOR BOATS
Joseph L. Bovenzi, 209 Douglas St., Syracuse, N.Y.
Filed Jan. 7, 1972, Ser. No. 216,196
Int. Cl. B63b *45/02*
U.S. Cl. 114—221 **2 Claims**



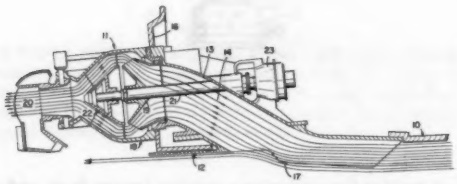
A bracket for supporting a gasoline lantern in an oarlock socket of a boat has a circular band for embracing the bottom of the lantern and a U-shaped strap pendantly secured at its ends to the band to provide a floor for the lantern. Two loops of compressible material are slideably secured on the band and an inverted U-shaped clip has a thumbscrew therethrough and threaded through one leg of the strap for forcing the lantern base toward the loops. A bent washer is welded to the bottom center of the strap and a pendant rod adapted to be contained in the oarlock socket is secured to the washer by a thumbscrew through the upper end of the rod and threaded through the pendant portion of the washer so that the angular disposition of the bracket can be adjusted.

3,752,109
ECOLOGICALLY CONTROLLED SHIP'S HULL RECONDITIONER
Ronald L. Seiple, 1060 Koohoo Pl., Lanikai, Hawaii
Filed Oct. 22, 1971, Ser. No. 191,669
Int. Cl. B63b *59/00, 35/44*
U.S. Cl. 114—222 **4 Claims**



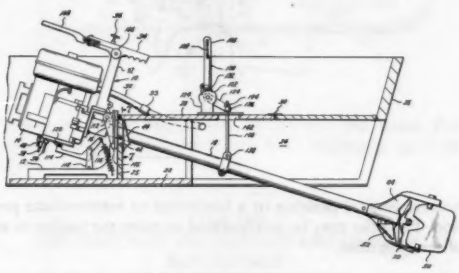
A floating platform is ballasted and trimmed to allow the passage of a ship through a U-shaped channel. A plurality of cylindrically shaped brushes is brought to bear against the ship's hull and interconnected motors rotate the brushes to clean fouling from the ship's hull as it traverses the length of the channel. Locating the platform outside of a harbor permits the cleaning of outgoing ships prior to transoceanic voyages to reduce fuel consumption while incoming ships are cleaned before entry to eliminate the possibility of harbor pollution. Incorporating a suction-pump filter unit in the close vicinity of each rotating brush ensures the collection of removed marine organisms to avoid contamination of surrounding waters. Additionally, a paint roller assembly is included to coat the scrubbed and cleaned surfaces with a new layer of anti-fouling paint to complete preventative maintenance of the hull and to recondition it.

3,752,110
AFTERPLANE FOR MARINE JET-POWERED BOATS
Ralph A. Rhoda, Orinda, Calif., assignor to Berkeley Pump Company, Berkeley, Calif.
Filed Mar. 20, 1972, Ser. No. 236,130
Int. Cl. B63h *11/02*
U.S. Cl. 115—16 **2 Claims**



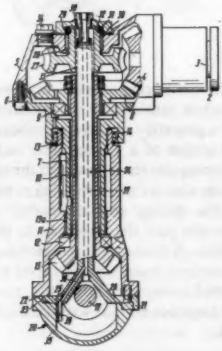
In a jet-powered boat wherein water is drawn through an inlet opening in the bottom of the hull, accelerated by an impeller pump and discharged through a jet nozzle to propel the boat forwardly, the improvement wherein an afterplane is secured to the boat rearwardly of the inlet opening, the afterplane being positioned so that the water flowing past the hull just below the layer of water taken into the inlet opening flows past and in contact with the underplane to exert upward forces thereon.

3,752,111
PIVOTING MOTOR BOAT DRIVE UNIT
Maurice J. Meynier, Jr., Houston, Tex., assignor to Crawfish Boat Company, Inc., Houston, Tex.
Filed May 5, 1971, Ser. No. 140,335
Int. Cl. B63h *5/12*
U.S. Cl. 115—35 **6 Claims**



A Pivoting Motor Boat Drive Unit for essentially flat bottom boats which automatically retracts upon hitting obstructions with a self-repositioning feature which is both variable and predetermined. The entire unit is readily removed from a tunnel mounted in a boat. The pivotal mounting includes a spring bias arrangement and may include an automatic throttle retarding switch and a cut-off switch when the unit is fully retracted. The propeller shaft includes a water bearing with a flow-through washer.

3,752,112
RUDDER PROPELLER FOR SHIPS AND AMPHIBIAN VEHICLES
Hans Eichinger, Munich, Germany, assignor to Schottel-Werft Josef Becker KG, Spay/Rhein, Germany
Filed Oct. 21, 1971, Ser. No. 191,523
Claims priority, application Germany, Oct. 31, 1970, P 20 53 633.8
Int. Cl. B63h *25/42*
U.S. Cl. 115—35 **9 Claims**



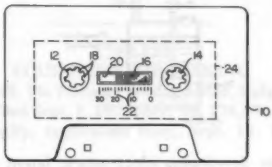
Outboard-inboard steering propeller construction. There is provided a non-rotatable upper housing attachable to the vessel and a rotatable lower housing supported by and from said upper housing. A propeller is rotatably supported in the lower housing and means for effecting rotation thereof extend through both housings and are drivingly connected to the propeller. A steering gear is rotatably supported within the upper housing but axially nonmovable with respect thereto. A steering shaft is splined to said gear and fixedly connected to the lower housing for effecting pivotal movement thereof. The

steering shaft is preferably bifurcated to extend on both sides of the propeller drive shaft and a passageway is provided through the steering shaft and a passageway is provided through the steering shaft and at least one arm of the bifurcated portion to permit venting of air which could otherwise be trapped in the lower end of the pivotal housing.

3,752,113
CASSETTE TAPE MOVEMENT INDICATOR

Frederick Blechman, 23958 Archwood St., Canoga Park, Calif.

Filed Aug. 2, 1971, Ser. No. 168,081
Int. Cl. G01d *21/00*
U.S. Cl. 116—114 R **12 Claims**

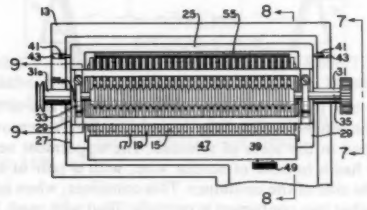


A cassette tape movement indicator having indicating means coupled to the takeup hub of the tape cassette, the indicating means being viewable through the window of a cassette recorder. In one embodiment the indicating means is a removable insert having a plurality of radially extending tines from a central portion having downwardly depending projections adapted for engagement with the inwardly extending projections on the hub of the cassette. In a second embodiment a transparent disc is coupled to the hub internally of the cassette, the disc having markings thereon viewable through the window in the cassette, one disc being associated with each hub of the cassette, the discs being positioned on that side of the hub which is viewable through the window of the cassette when that particular hub has tape being wound thereon.

3,752,114
ADHESIVE APPLYING MACHINE

Charles L. Knight, Akron, Ohio, assignor to Portage Newspaper Supply Company, Summit, Ohio

Continuation-in-part of Ser. No. 4,702, Jan. 21, 1970, abandoned. This application June 16, 1971, Ser. No. 153,564
Int. Cl. B05c *1/08*
U.S. Cl. 118—5 **10 Claims**

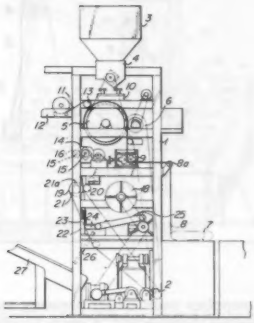


The invention relates to a compact, inexpensive, and highly efficient adhesive wax applying machine which utilizes an adhesive applying roller dipping into a heated tank carrying the adhesive. A top roller is arranged in cantilevered relationship to cooperate with the bottom roller. Means are provided to drive both rollers. The adhesive tank is heated, and is preferably cast aluminum to facilitate heat transfer to both rolls. The cover is plastic to provide insulation, and is easily removable. Adjustments are provided for doctor bars, and takeoff means, as well as for the rollers to facilitate its use and cleaning.

3,752,115
APPARATUS FOR AUTOMATICALLY PRODUCING POULTICE

Motoyasu Watanabe, Tokyo, Japan, assignor to Daiichi Seiyaku Company Limited, Tokyo, Japan

Filed Oct. 4, 1971, Ser. No. 186,070
Claims priority, application Japan, Oct. 5, 1970, 45/99089 (utility model); Oct. 9, 1970, 45/100669 (utility model)
Int. Cl. B05c *11/00*
U.S. Cl. 118—39 **1 Claim**

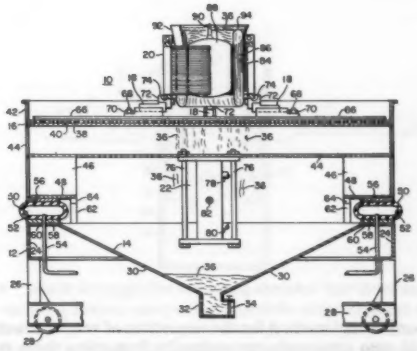


An apparatus for automatically producing poultice and a means for applying poultice paste to substrate cloth automatically supplied which may be used in the said apparatus.

3,752,116
SHAKER DEVICE FOR COMPACTING POWDERED RESIN INTO SLOTS OF MAGNETIC CORES

Kipple Harry P., Pittsburgh, Pa.; Virgil J. Cozzarin, Clarence, N.Y., and Francis C. Kapperman, deceased, late of Eggertsville, N.Y. (by Dorothy M. Kapperman, administratrix), assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 14, 1970, Ser. No. 71,933
Int. Cl. B05c *11/14, 7/00*
U.S. Cl. 118—57 **7 Claims**

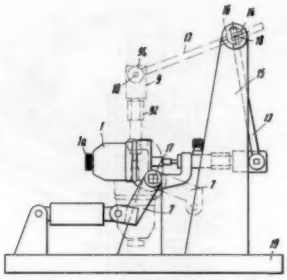


Apparatus for shaking and compacting heat hardenable powdered resin into interstices between coil windings in a slot of a core of magnetic material, including a vibrating perforated table, clamps adjustably mounted on the table for holding a core in place with the slot in vertical position, a vibrator mounted under the table for shaking the core vertically, and a hopper under the table for collecting excess resin when powdered resin is spread over the upper open ends of the slot.

3,752,117
SPRAYING APPARATUS

Paul Hammelmann, Zum Sundern 17, Oelde, Germany

Filed Nov. 30, 1971, Ser. No. 203,494
Claims priority, application Germany, Dec. 1, 1970, P 20 59 038.9
Int. Cl. B05b *15/02*
U.S. Cl. 118—302 8 Claims

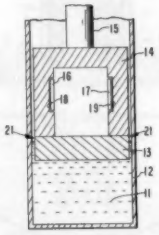


A spray head supplies paint under pressure and is mounted for pivotal movement through 90°. A spray nozzle receives the paint from the spray head and has a passage which converges towards its outlet. The spray nozzle is also mounted for 90° pivotal movement, and coupling means couples the spray head with the spray nozzle, so that the same will move in unison between their respective positions so that the spray nozzle may be pivoted from spraying position to a position in which its outlet is directed away from the surface to be sprayed and permits clearing of the passage.

3,752,118
APPARATUS FOR LIQUID EPITAXY

Raymond Solomon, Sunnyvale, and Dennis De Fevere, Palo Alto, both of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Oct. 13, 1971, Ser. No. 188,785
Int. Cl. B05c *3/09*
U.S. Cl. 118—422 4 Claims

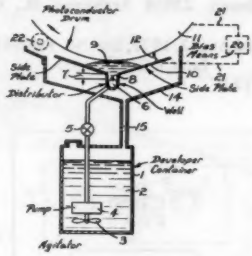


Apparatus and method for the deposition of semiconductor material onto semiconductor wafers by immersing them in a source of liquid semiconductor material. The apparatus includes a chamber, a wafer holder, and a plug, the plug adapted to rest upon the liquid residing in the chamber during mixing of the liquid, and to be pushed through the liquid, thereby forcing the liquid to flow through the space between the plug and the walls of the chamber, that space acting as a filter to prevent solid contaminants from coming into contact with the wafers in the holder. The floating plug also serves to prevent volatilization of constituents during the mixing of the semiconductor and dopants.

3,752,119
LIQUID TONER APPLICATOR

Josef Matkan, Malvern, Australia, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed June 10, 1971, Ser. No. 151,843
Claims priority, application Australia, June 11, 1970, 1483/70
Int. Cl. G03g *13/00*
U.S. Cl. 118—637 5 Claims

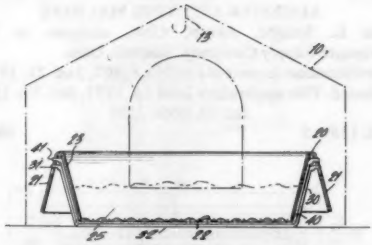


A means for developing electrostatic latent images using liquid dispersed toners, using a distributor mounted in a substantially horizontal position and having disposed in it exit means whereby dispersed toner fed into the distributor is moved to form a pool in an area above the distributor in which the distributor and side plates are positioned in relation to the surface bearing the electrostatic latent image to be developed so that the pool of liquid dispersed toner touches the image bearing surface without direct stream impingement on the surface being developed.

3,752,120
CAT LITTER BOX

Sam W. Pallesi, Fresno, Calif., assignor to Th Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Nov. 22, 1971, Ser. No. 200,818
Int. Cl. A01k *29/00*
U.S. Cl. 119—1 2 Claims



A litter box for use by cats, consisting of a series of three nesting containers, which may be enclosed by a removable hood shaped in the form of a house. The uppermost nesting container has a bottom of screen wire, with a pair of handholds in the side of the container. This container, when nested over the other two containers is partially filled with sand. Each of the other two containers, with solid bottoms have projecting tabs along the side for use as handholds.

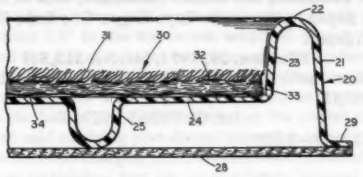
3,752,121
ANIMAL COMMODE

Jack W. Brazzell, 3416 Brigham St., Toledo, Ohio

Filed Nov. 12, 1971, Ser. No. 198,349
Int. Cl. A01k *29/00*
U.S. Cl. 119—1 15 Claims

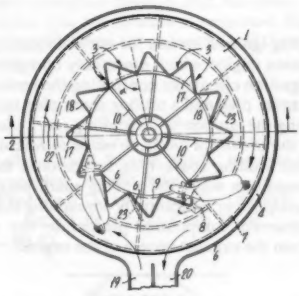
A reinforced bottom grooved plastic tray in which is placed disposable pads, each pad comprising a top layer of artificial

grass impregnated with an animal attractant, which is adhered to a perforated plastic sheet beneath which is an abosrbant



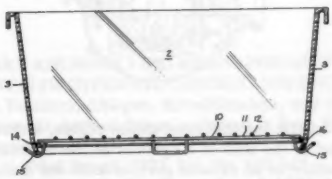
layer backed by an impervious sheet. A container of deodorizer and a plurality of disposable pads may be packaged with each tray.

3,752,122
EQUIPMENT FOR MILKING
Giorgio Ciribelli, Via Privata Penza 6, Milan, Italy
Filed Sept. 1, 1971, Ser. No. 176,996
Claims priority, application Italy, Sept. 11, 1970, 29622 A/70
Int. Cl. A01j *5/00*
U.S. Cl. 119—14.04 **5 Claims**



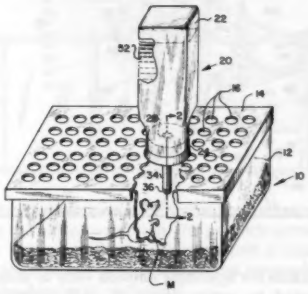
A cow milking equipment comprises a rotable annular platform continuously rotated at a constant speed by a suitable motor and is provided with a plurality of stall angulated relative to a radial direction, for accomodating a cow that is to be milked, so as to enable the animal to enter and exit from the stall always passing over the outer peripheral edge of the platform.

3,752,123
ANIMAL CAGE
Anthony V. Classe, New York, N.Y., and Robert P. Mehn, Middletown, N.J., assignors to Maryland Plastics Incorporated, Federalsburg, Md.
Filed Dec. 1, 1971, Ser. No. 203,604
Int. Cl. A01k *31/06, 01/00*
U.S. Cl. 119—17 **2 Claims**



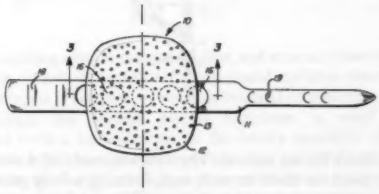
The present invention comprises an animal cage lid which has a removable wire mesh bottom.

3,752,124
WATERING BOTTLE ASSEMBLY FOR ANIMALS
George S. Gabriel, Mahwah, N.J., assignor to Lab Products, Inc., Garfield, N.J.
Filed Sept. 28, 1971, Ser. No. 184,442
Int. Cl. A01k *07/00*
U.S. Cl. 119—72.5 **7 Claims**



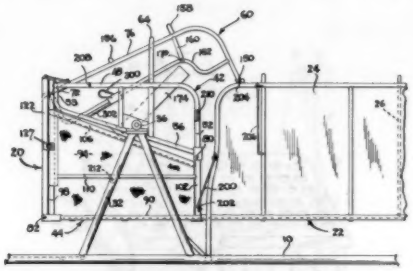
A watering bottle assembly for caged laboratory animals includes a completely hollow cylindrical tube of transparent plastic material mounted at one end in the stopper of a water bottle. In the free end of the tube a one-piece metal tip is frictionally mounted, the tip having an enlarged semi-spherical head portion projecting from the plastic tube and having a water outlet aperture accessible to the caged animals for drinking. The outer diameter of the tube is substantially equal to the outer diameter of at least a portion of the enlarged head portion of the metal tip.

3,752,125
ANIMAL BRUSH
M. Ward Jackson, 1789 E. Maryland Avenue, St. Paul, Minn.
Filed July 14, 1971, Ser. No. 162,574
Int. Cl. A01k *13/00*
U.S. Cl. 119—83 **14 Claims**



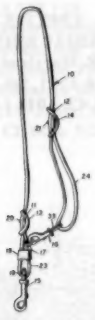
An article is taught for removing shedded hair from animals by stroking action, comprising a flexible abrasive sheet structure and holder means, such as a strap, connected to the abrasive sheet structure for fastening it to the palm side of one's hand for stroking action. The abrasive sheet structure includes a flexible backing and a layer of randomly-distributed coarse abrasive grit particles of a size larger than grit 70, preferably larger than grit 40, bonded to the exposed face. Open coated aluminum oxide grit layers are preferred. A mechanical interlock structure comprising the abrasive sheet, a special back up pad, and an intermediate strap holder member, permits adhesive locking of the abrasive sheet to the strap even though the strap may be of a material to which it is notoriously difficult to adhere anything by the usual adhesive or bonding techniques.

3,752,126
ANIMAL HANDLER
Henry W. Rhoades, 849 I St., Williams, Calif.
Filed Jan. 26, 1972, Ser. No. 220,827
Int. Cl. A61d 3/00
U.S. Cl. 119—103 28 Claims



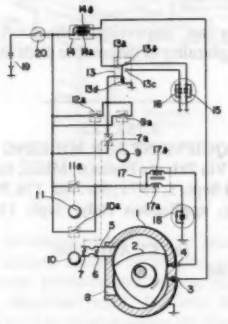
An apparatus for upending animals such as sheep, having a chute adapted to entice entry of such animals, a cradle adapted to be forced into contact with the animal, and means for rotating the cage formed between the chute and cradle.

3,752,127
LEASH FOR AN ANIMAL
Calvert W. Baker, R.D. No. 2, Buffalo St. Ext., Jamestown, N.Y.
Filed Nov. 8, 1971, Ser. No. 196,678
Int. Cl. A01k 03/00
U.S. Cl. 119—109 2 Claims



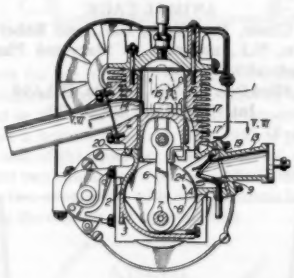
A leash for an animal. The leash is made of a strap that is bent back on itself at each end, forming a loop at each end, and a snap is placed in each loop. The snap has a rounded part through which the strap passes. The rounded part is slightly lesser in diameter than the width of the strap whereby the snaps deform the strap and hold the strap in position. The ends of the strap each pass through a buckle where the loop is held intact. A keeper is formed at one end of the strap between the buckle and the strap and a D-shaped ring is supported on the end of the strap adjacent the keeper between the keeper and the buckle. This ring can receive the second snap. The first snap can be snapped into the collar of a dog or the like to lead the dog. Thus the second loop formed is considerably larger than the first loop and forms a convenient hand-receiving handle. A person can pass his forearm through the large loop, or it could be placed over a fence post or other anchoring means to restrain the dog. The dog can be lead on a short effective leash by snapping the second snap into the ring and snapping the first snap into the dog's collar.

3,752,128
SPARK PLUG IGNITION SYSTEM FOR USE IN ROTARY PISTON ENGINE
Yasuo Tatsutomi, and Hitoshi Nakamura, both of Hiroshima-shi, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima-ken, Japan
Filed Dec. 29, 1971, Ser. No. 213,519
Claims priority, application Japan, Dec. 29, 1970, 45/135552
Int. Cl. F02b 53/12
U.S. Cl. 123—8.09 4 Claims



A spark plug ignition system for use in a rotary piston internal combustion engine which essentially comprises a leading spark plug ignition circuit for controlling the ignition timing of the leading spark plug and a trailing spark plug ignition circuit for controlling the ignition of the trailing spark plug. In this arrangement, the provision has been made to retard the ignition timing of the leading spark plug in response to the engine operating condition while the trailing spark plug is switched off, for the purpose of substantially eliminating the emission of noxious unburned compounds present in the exhaust gas emerging from the exhaust system of the engine.

3,752,129
TWO-CYCLE INTERNAL COMBUSTION ENGINES
Torao Kobayashi; Hisashi Inaga, both of Suginami-ku, Tokyo, and Kumaichi Nakagawa, Kokubunji-shi, all of Japan, assignors to Kioritz Corporation, Tokyo, Japan
Filed Mar. 7, 1972, Ser. No. 232,569
Claims priority, application Japan, Dec. 17, 1971, 46/102483
Int. Cl. F02b 33/04
U.S. Cl. 123—73 A 1 Claim



In a two-cycle internal combustion engine, a charging port is provided in the wall of a cylinder at the diametrically opposite position to an exhaust port; at least one main scavenging port at least one auxiliary scavenging port are provided on each side of a vertical plane which includes the straight line interconnecting the centers of said exhaust and charging ports

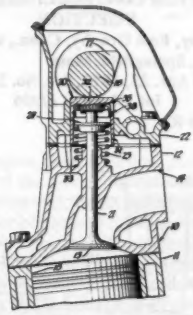
and extends along the axis of the cylinder, in such a way that said auxiliary scavenging port is closer to said charging port than said main scavenging port; the directions of said main and auxiliary scavenging ports are so established that the mixture may be injected from said respective ports upwardly at an angle of about 15° to the transverse sectional plane of the cylinder and the jets of mixture may intersect each other in a predetermined region which is located on the diameter of the cylinder contained in said vertical plane and at a position more than the half of the distance between the center of the cylinder and said charging port distant from the center of the cylinder toward said charging port; the direction of said charging port is so established that the jet of mixture injected from said port may be directed toward a space slightly above said region of intersection of said scavenging flows and flow along the upper side of said scavenging flows without directly crossing them; and that reed valve means through which the mixture is sucked is disposed in that side of the crank case where the tangential component of rotational force of the crank shaft is directed toward the cylinder skirt and at a position adjacent said cylinder skirt, and the openings of said charging and auxiliary scavenging passage and, if necessary, the opening of said main scavenging passage are located circumferentially of said cylinder skirt and adjacent said reed valve means, whereby a kinetic energy is imparted to the mixture, sucked into the crank case, by making use of the tangential component of rotational force of the crank shaft and thereby the mixture is urged toward and directed into the openings of said respective passages and, therefore, the charging of the mixture into the cylinder is promoted, the scavenging and charging efficiency are enhanced and the engine output is increased.

3,752,130

MECHANICAL VALVE LIFTER

Elias W. Scheibe, Grand Rapids, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 15, 1972, Ser. No. 289,418
Int. Cl. F01l *1/20*; F16h *53/06*
U.S. Cl. 123—90.52 **3 Claims**



A mechanical valve lifter having a sliding tapered wedge to effect valve adjustment, the wedge being retained in the desired position within the lifter by means of a retainer secured within the lifter and having spring arms thereon positioned to engage serrations in the wedge.

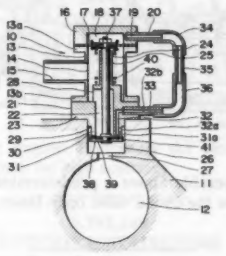
3,752,131

PRIMARY AIR SUPPLYING MEANS FOR AN INTAKE SYSTEM OF INTERNAL COMBUSTION ENGINE

Terutoshi Tsumura, Aki-gun, Hiroshima-ken, and Koso Iida, Hiroshima-shi, both of Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima-ken, Japan

Filed June 3, 1971, Ser. No. 149,543
Claims priority, application Japan, June 4, 1970, 45/55443
Int. Cl. F02d *31/00*; F02b *33/00*
U.S. Cl. 123—97 B **11 Claims**

A primary air supplying means for an intake system of an internal combustion engine having a valve member adapted to permit the flow of a primary air during the deceleration of the engine, said valve member forming an orifice in cooperation with a valve housing for housing said valve member, and a sensing tube opened at the upstream of the orifice of the valve member when said valve member is in the open condition and



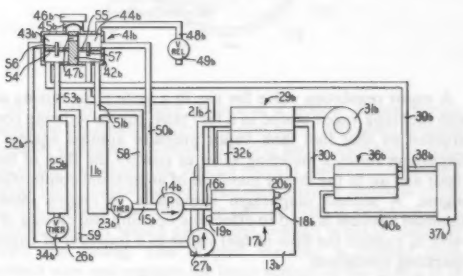
opened at the downstream of a valve seat when said valve member is in the closed condition, the pressure present in said sensing tube being equalized to the negative pressure during the normal drive of the engine and to the atmospheric pressure during the deceleration thereof.

3,752,132

DUAL COOLING SYSTEM FOR ENGINES

Erwin J. H. Bentz, Washington, and Roger D. Hiserote, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 810,255, March 25, 1969, abandoned. This application Apr. 19, 1971, Ser. No. 135,497
Int. Cl. F01p *3/04*; F02b *33/00*
U.S. Cl. 123—119 CD **10 Claims**



A dual cooling system comprises first and second closed circuits, each circuit including an air-to-liquid radiator therein. The first circuit is adapted to cool an internal combustion engine whereas the second circuit functions to cool air discharged from a turbocharger to the intake manifold of an internal combustion engine. The system may comprise means for bypassing the radiators when temperature levels fall below predetermined levels and a single supply and expansion tank for supplying the two circuits with cooling fluid. A baffle is positioned in the tank's chamber to divide it into two compartments with each compartment communicating with one of the circuits.

3,752,133

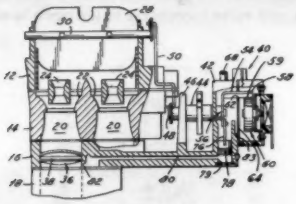
MULTIPLE HEAT AUTOMATIC CHOKE

David C. Irish, Dearborn, and Richard J. Junttonen, Farmington, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 15, 1972, Ser. No. 306,776
Int. Cl. F02d *11/08*; F02n *1/10, 23/04*
U.S. Cl. 123—119 F **12 Claims**

The carburetor has a conventional automatic choke construction heating a bimetallic coil by engine exhaust stove heat to slowly open the choke valve during cold weather starts; supplemental heat is provided by electrically controlled positive

temperature coefficient heater devices, the smaller of which is operable at all times concurrent with the stove heat, the larger



device being operable above a predetermined ambient temperature to move the choke valve open faster, to reduce emissions.

3,752,134

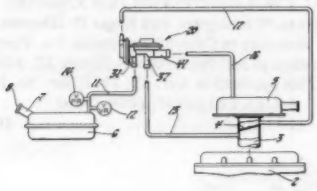
VAPOR REGULATING VALVE

Thomas J. Hollis, Jr., Fairport, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 5, 1972, Ser. No. 241,350

Int. Cl. F02d *19/00*

U.S. Cl. 123—136 **8 Claims**



A vapor regulating valve for use in a system for mixing air with fuel tank vapor stored in a fuel tank, the valve being constructed so that fuel tank vapor pressure applied against a diaphragm raises a metering valve to control the flow of fuel vapor and air to the intake manifold of an internal combustion engine. A second diaphragm responsive to engine intake manifold vacuum is used to effect the opening and closing of a valve to control the flow of fuel vapor as a function of engine operating conditions.

3,752,135

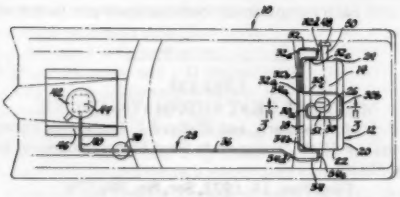
VEHICLE FUEL TANK VENTING SYSTEM

Donald W. Peterson, Fenton, and Floyd A. Wyczalek, Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 26, 1971, Ser. No. 202,263

Int. Cl. F02m *59/00*

U.S. Cl. 123—136 **4 Claims**



A venting system for a vehicle fuel tank has a vent line which extends a selected distance above, below, and to either side of the fuel tank to contain liquid fuel against loss to the atmosphere irrespective of the attitude of the vehicle.

3,752,136

LIQUID FUEL INJECTION PUMPING APPARATUS

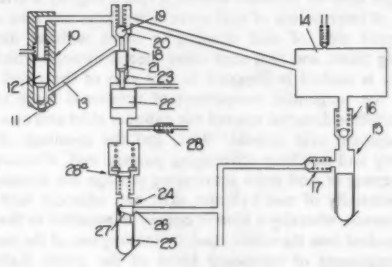
Basil Edward Knight, deceased, late of Kings Langley, England (by Norman Henderson Knight, executor); Harold Redmore Hodge, executor, Eastcote, Pinner, and Ivor Fenne, Greenford, both of England, assignors to C. A. V. Limited, Birmingham, England

Filed July 8, 1971, Ser. No. 160,805

Claims priority, application Great Britain, July 10, 1970, 33,570/70

Int. Cl. F02m *47/02*

U.S. Cl. 123—139 AT **14 Claims**



A fuel injection pumping apparatus includes an accumulator, a pump for charging the accumulator with fuel under pressure and a differential valve for controlling fuel flow from the accumulator to an orifice. In addition, a control valve is provided to control the application of fuel under pressure to the differential valve, the control valve embodying a valve element which is lifted from its seating to apply fuel to the differential valve, and there is in addition, a piston which upon closure of the control valve, moves to reduce the pressure acting on the differential valve.

3,752,137

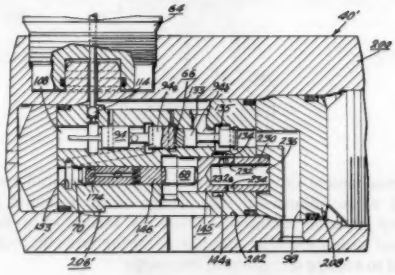
APPARATUS FOR CONTROLLING RATE OF FUEL INJECTION

John A. Kimberley, East Granby, Conn., assignor to AMBAC Industries, Inc., Springfield, Mass.

Filed Apr. 25, 1972, Ser. No. 247,333

Int. Cl. F02d *11/06*

U.S. Cl. 123—139 R **13 Claims**



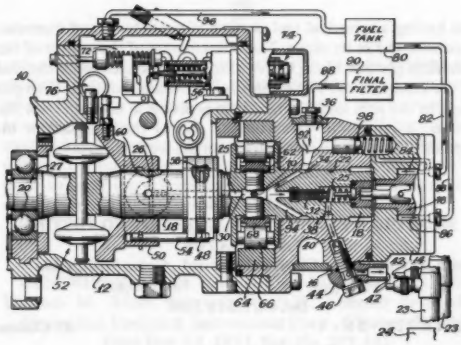
Means for control of the rate of fuel injection in a diesel engine injection system characterized by a separate fuel injector for each engine cylinder. Each injector is supplied with discrete metered quantities of fuel which are discharged therefrom upon actuation of the injector by an injector piston which is driven by a high pressure fluid to pump the fuel through an associated injection nozzle. The rate of injection is controlled by varying the rate of flow of the high pressure fluid into the piston chamber. In the preferred embodiment, the piston comprises an elongated cylindrical member having a concentric bore open at one end and having ports opening into said bore through which the high pressure fluid passes

from a communicating annulus. The piston ports are shaped in a predetermined configuration to cooperate with the annulus as the piston travels across the annulus to regulate the rate of flow of fluid into the piston bore and hence the rate of travel of the piston and the rate of injection of the fuel through the injection nozzle. In a modified embodiment, a plurality of piston ports are utilized to produce a pilot injection prior to the main injection. To facilitate the return of the piston following injection, a spill conduit connecting with the end of the piston chamber is provided which is opened in proper timed relationship to the piston movement by the valve controlling the admission of the high pressure fluid to the piston chamber.

3,752,138
ENGINE INJECTION PUMP OPERATING ALL CYLINDERS OR LESS

John W. Gaines, Wheaton, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Aug. 9, 1971, Ser. No. 170,178
Int. Cl. F04b *49/08*; **F04d** *15/00*; **F02m** *39/00*
U.S. Cl. 123—139 R **2 Claims**



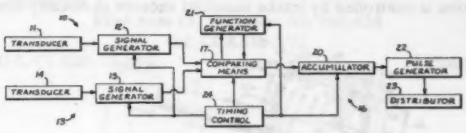
Multi-cylinder engine, and injection pump for operating same on a fraction of the number of cylinders, then a greater fraction of that number and, finally, all of the cylinders when operating in all higher portions of the speed range. Viewed the other way, the pump operates all cylinders at full load, and cuts a plurality or pluralities of those cylinders out of operation until, at engine idle, the transition is made such that only a plurality of cylinders is still firing, and all such transition control is consolidated in a controlled fuel metering sleeve in the pump. The pump is of the rotary distributor type, and has a variable volume pump chamber portion whereof the pump chamber number is materially fewer than the number of engine cylinders and preferably is limited to one or two pump chambers.

3,752,139
ELECTRONIC IGNITION TIMING SYSTEM FOR INTERNAL COMBUSTION ENGINES

Robert W. Asplund, Williamsport, Pa., assignor to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Filed Nov. 23, 1971, Ser. No. 201,363
Int. Cl. F02p *3/02, 5/00*
U.S. Cl. 123—146.5 A **15 Claims**

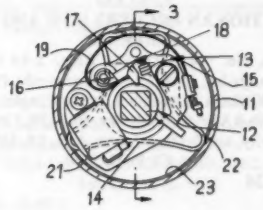
An electronic ignition timing system for internal combustion engines is disclosed which utilizes electronic circuitry to vary the timing of ignition pulses in response to engine speed and vacuum to provide optimum or improved performance by the engine. Preferably the electrical circuitry utilizes digital signals for high accuracy.



3,752,140
IGNITION DISTRIBUTORS

Alfred Rees, Perry Barr, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Oct. 7, 1971, Ser. No. 187,270
Claims priority, application Great Britain, Oct. 30, 1970, 51,632/70
Int. Cl. H01h *19/62*
U.S. Cl. 123—146.5 A **8 Claims**



An ignition distributor including a hollow casing having journalled for rotation therein a cam shaft. A contact breaker assembly is mounted within the casing and is operable by rotation of the cam shaft, the contact breaker assembly including a carrier plate supporting the fixed and movable contacts of the contact breaker assembly. The carrier plate is mounted on a support member which carries the contact breaker assembly within the casing. The support member is formed from resilient wire and engages the inner surface of the casing at at least three angularly spaced points. The arrangement of the support member within the casing resists relative axial movement between the casing and the support member, and conveniently the arrangement includes a groove on the inner surface of the casing within which the wire seats.

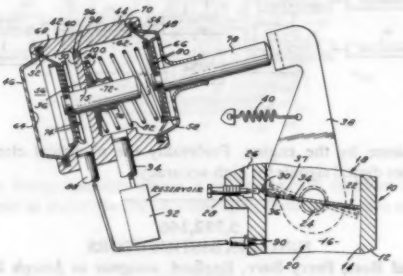
3,752,141
VACUUM CONTROLLED CARBURETOR THROTTLE VALVE POSITIONER

William W. Charron, Orchard Lake; Robert S. Harrison, Detroit, and Harold E. Marcum, Dearborn, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 165,991, July 26, 1971. This application Aug. 7, 1972, Ser. No. 278,673
Int. Cl. F02m *19/12, 1/14*; **F02d** *33/00*
U.S. Cl. 123—198 DB **6 Claims**

A downdraft type carburetor in one embodiment has an idle system discharge port that is straddled by the normal idle speed and closed throttle positions of the throttle valve so as to permit idle speed fuel and air flow in one position and no flow in the other position; a second embodiment has a conventional idle system including a transfer port cooperating with the edge of the throttle valve to provide normal idle speed fuel and air flow while reducing the idle system fuel flow in the

closed position of the throttle valve; both embodiments have a third beyond normal idle, or fast idle speed position provided for engine startup; the three positions are controlled by a servo operatively engaging the throttle valve; the servo operation is controlled by intake manifold vacuum to initially close



the throttle valve upon engine shut off, with a subsequent return of the throttle valve to its fast idle position for engine restarting, or to return the throttle valve to a normal idle position upon release of the vehicle accelerator pedal during engine operation.

3,752,142

IN COMBINATION AN ARCHERY BOW AND VIBRATION DAMPENER

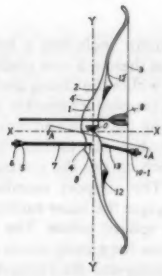
Houyu Morita, No. 9 c/o Tanaka Bldg. 2-14 Dogenzaka 4-chome, Dhinuys-ku, Tokyo, and Kazuyoshi Okino, 3050-2 Mukainada-Ohhara, Hiroshima, both of Japan

Filed Apr. 9, 1971, Ser. No. 132,739

Claims priority, application Japan, Apr. 18, 1970, 45/33762

Int. Cl. F41b *5/00*

U.S. Cl. 124—24 **2 Claims**



A vibration dampener for an archery bow having a bow handle and a bow string. The dampener has two legs arranged in a U shape and positioned rearwardly of the belly of the bow on either side of a plane passing through and including the full length of the archery bow and the bow string. A third leg extends outwardly from the back side of the bow, and each one of said legs has a weighted member attached to its free terminal end.

3,752,143

APPARATUS FOR SHAPING A GRINDING WHEEL

Pierre Trochet, 4 bis, Avenue Foch 92, La Garenne-Colombes, France

Filed Apr. 8, 1971, Ser. No. 132,439

Claims priority, application France, Oct. 28, 1970, 7038864

Int. Cl. B24b *53/06*

U.S. Cl. 125—11 A **5 Claims**

A device for adjusting the position of a diamond point in an apparatus for shaping a grinding-wheel. A holder for the diamond point is slidably mounted in an arm which is rotatably mounted about a working axis. The working axis intersects the axis of the path of travel of the diamond point. The device itself comprises a comparator including a probe retractably mounted on the apparatus. The probe is adapted to be brought into position along the axis of the path of travel of the diamond point. To check the position of the diamond point, the latter is removed from the holder and a measuring

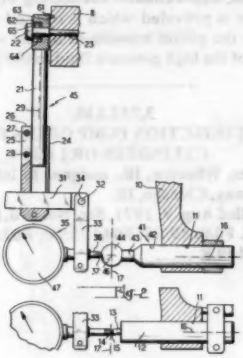


Fig. 2

rod having a spherical end portion of predetermined diameter is substituted in its place. The coincidence of the center of the spherical portion along the working axis is checked on the dial of the comparator. The holder for the diamond point then put back in the arm and brought into position in contact with the probe ; a particular value on the dial of the comparator indicates that the diamond point is on the working axis.

3,752,144

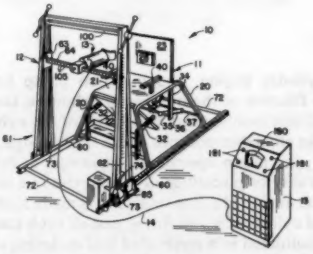
MUSCULAR EVALUATION METHOD AND TESTING APPARATUS

Keith E. Weigle, Jr., Chagrin River Rd., Gates Mills, Ohio

Filed July 23, 1971, Ser. No. 165,683

Int. Cl. A61b *5/00*

U.S. Cl. 128—2 S **31 Claims**



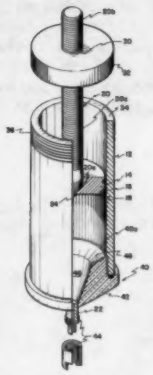
An adjustable apparatus and method for positioning a force sensor adjacent various portions of the patient's body and for measuring and recording forces exerted by the voluntary muscles of the patient. The apparatus is calibrated such that the adjustment of the apparatus for positioning the patient and the force sensor may be recorded and later exactly reproduced. An adjustable calibrated platform positions the patient while an adjustable calibrated frame positions the force sensor. The frame and the patient support platform are relatively movable such that the force sensor may be positioned adjacent substantially any portion of the patient's body. The adjustments of the apparatus are recorded such that the position of the patient and the force sensor may later be duplicated to compare the patient's muscular condition at spaced time intervals.

3,752,145

METHOD FOR PREVENTING AIR EMBOLISM IN A SYRINGE FOR ANGIOGRAPHIC POWER INJECTOR

Robert R. Runnells, Fruit Heights, and Frank W. Longson, Salt Lake City, both of Utah, assignors to MDT Instrument Company, Salt Lake City, Utah

Filed Nov. 1, 1971, Ser. No. 194,747
Int. Cl. A61b *5/02*; A61m *5/18*
U.S. Cl. 128—2 R 3 Claims



A power injector or syringe designed for use in angiographic studies having a cylindrical, hollow housing and a plunger or piston fitted for reciprocating action within the housing. The housing is provided with a transparent, magnifying conical-shaped head for more easily detecting air bubbles entrained in a liquid contained by the syringe. Detection of these bubbles prior to injection minimizes the chances of air embolism during intravenous injections.

3,752,146

CENTRIFUGE TUBE FOR ULTRA-VIOLET ANALYSIS

William M. Kline, Gloversville, N.Y., assignor to Medical Evaluation Devices & Instruments Corp., Gloversville, N.Y.

Filed Dec. 13, 1971, Ser. No. 207,192
Int. Cl. A61b *10/00*
U.S. Cl. 128—2 A 8 Claims

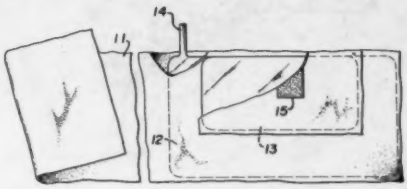
This invention is directed to a centrifuge tube formed from a transparent plastic and provided at its bottom with a penetratable membrane through which an optical fiber element is passed upon completion of centrifuging of the contents to enable visual observation of the effect of light, particularly ultra-violet light, on the contents, when compared with a standard or control, to detect the presence or absence of a predetermined type of foreign matter in the centrifuged contents of the tube. The optical fiber element may be formed from quartz or from such a material as a methyl methacrylate capable of transmitting ultra-violet light.

3,752,147

BLOOD PRESSURE CUFF

Salvador Castro, Levittown, Pa., and Edwin Lewis Schmalzbach, Roosevelt, N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Filed June 13, 1972, Ser. No. 262,424
Int. Cl. A61b *5/02*
U.S. Cl. 128—2.05 C 4 Claims



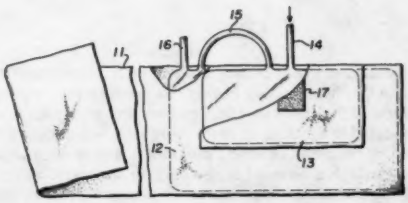
An inflatable cuff for deriving blood pressure data by uniform vessel occlusion in all shape limbs to provide accurate compression comprising an inflatable bag and a pad positioned lengthwise in the cuff and in an overlying relationship within the cuff, the pad being smaller than the bag in its width dimension and distally positioned on the cuff and connected so as to anchor the cuff to the subject's extremity and generate a substantially uniform pressure compression pattern along the extremity length under the cuff.

3,752,148

DUAL BAG BLOOD PRESSURE CUFF

Edwin Lewis Schmalzbach, Roosevelt, N.J., assignor to Hoffman-La Roche Inc., Nutley, N.J.

Filed June 13, 1972, Ser. No. 262,425
Int. Cl. A61b *5/02*
U.S. Cl. 128—2.05 C 5 Claims



An inflatable cuff for deriving blood pressure data by uniform vessel occlusion in all shape limbs to provide accurate compression comprising first and second inflatable bags positioned lengthwise in the cuff and in an overlying relationship within the cuff, the second bag being smaller than the first in its width dimension and distally positioned on the cuff, and the first and second bags connected so as to initially supply the second bag with a greater air pressure than that supplied to the first bag to anchor the cuff to the subject's extremity and generate a uniform pressure compression pattern along the extremity length under the cuff.

3,752,149

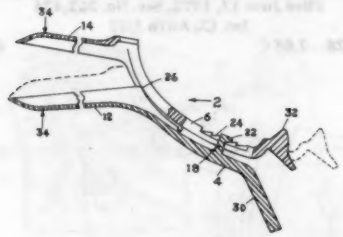
VAGINAL SPECULUM

Leslie Ungar, 37 Heathdale Rd., and Arthur Rosenthal, 67 Baycrest Ave., both of Toronto, Ontario, Canada

Filed Dec. 16, 1971, Ser. No. 208,714
Int. Cl. A61b *1/30*
U.S. Cl. 128—12 10 Claims

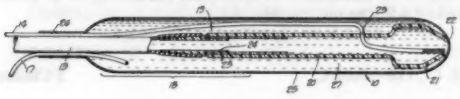
A vaginal speculum of the bivalve type which includes two blades in superposed relation capable of moving from a closed

position in which the blades are closely spaced to an open position in which they are widely spaced; said blades being



movable between said open and closed positions along an arucate path which provides angular variation as well as separation in one sweeping movement.

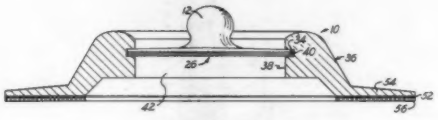
3,752,150
EXERCISING APPARATUS
John P. Harris, P.O. Box 187, Wofford Heights, Calif.
Filed Aug. 30, 1971, Ser. No. 176,170
Int. Cl. A61b *5/10*
U.S. Cl. 128—2 S **9 Claims**



An elongated resilient core member is surrounded by an oversize flexible covering having one open end through which a portion of the core extends. The covering adjacent the opening is sealed to the core. A first tubing attached to the core and extending from the covering provides a supply of pressurized liquid through a channel in the core to the covering interior for filling and distending the same, spacing it from the core at all points except where sealed. A second tubing provides communication between the contained liquid and an externally located pressure measuring device, e.g., a manometer. In use, the core and liquid-filled covering are inserted full depth into the vagina and the individual then trys to produce controlled contraction of the vaginal musculature, noting the degree of success on the pressure measuring device.

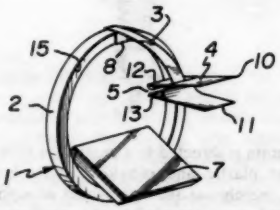
3,752,151
DISPOSABLE MEDICAL ELECTRODE WITH LAMINATE CONTACT MEMBER
Robert M. Robichaud, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Aug. 30, 1971, Ser. No. 176,050
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.06 E **7 Claims**

An electrode which provides improved performance while being characterized by a very economical construction to enhance disposability of the electrode after a single use in an electrocardiograph, heartbeat monitoring device or the like is shown to include a silver-plated, brass, snap-fastener component having a disc-like portion and a projecting ball-shaped portion. A disc of laminate material having a very thin layer of silver chloride bonded to a layer of silver-nickel alloy is secured to the disc-like portion of the snap-fastener by means of a weld which is located close to the edge of the laminate disc and to the edge of the snap-fastener disc portion, the layer of silver chloride being disposed to face away from the snap-fastener. The electrode further includes a body of electrically insulating material which has a central opening and which has an annular groove extending around the wall of the body opening, this annularly grooved portion of the insulating body being fitted over and sealed to the edge of the laminate disc and the edge of snap-fastener disc portion so that the projecting ball-shaped portion of the snap-fastener is disposed at one end of the body opening in a convenient location to be releasably connected to electrical contact means such as a mating snap-fastener component and so that the opposite end of the body opening cooperates with a portion of the silver



chloride layer of the laminate disc to define a cavity which receives and holds an electrolyte paste between the layer of silver chloride and the skin of a patient. In this electrode construction, the advantages in performance known to result from the use of a silver chloride layer on a body of silver material are inexpensively achieved and additional improvement in performance is provided by use of a nickel-bearing silver alloy to support the silver chloride material. In addition, although the electrode construction is characterized by low cost, the construction avoids all possible contact of the electrolyte paste with junctures of unlike metal materials in the electrode, thereby avoiding the development of spurious electrochemical effects so that the electrode provides an accurate, rapidly stabilized signal in physiological measuring apparatus with minimal introduction of noise in the signal traceable to the electrode construction.

3,752,152
EYE EXAMINATION DEVICE
Seymour P. Kern, Belleville, N.J., assignor to Applied Life Design Corporation, Bloomfield, N.J.
Filed Feb. 16, 1972, Ser. No. 226,818
Int. Cl. A61b *1/00*
U.S. Cl. 128—21 **5 Claims**



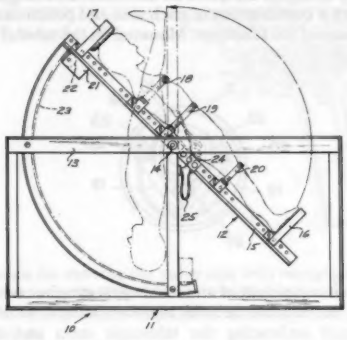
Disclosed herein is a simple, eyelid-supportable device useful for painlessly examining the upper conjunctival sac of the eye.

3,752,153

HEAD STAND EXERCISER

Doris E. Copeland, 457 Bryn Mawr St., San Antonio, Tex.

Filed May 5, 1972, Ser. No. 250,792
Int. Cl. A61h *1/00*
U.S. Cl. 128—24 R **1 Claim**



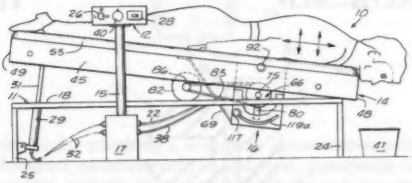
A platform provided with a harness for complete comfortable support is rotatable by the user and controlled during use both in degree of rotation and duration at any position up to the head down position.

3,752,154

THERAPEUTIC VIBRATING MACHINE

James A. Clark, Orange, Calif., assignor to Clark Mobilizer, Inc., Downey, Calif.

Filed May 16, 1972, Ser. No. 253,825
Int. Cl. A61h *1/00*
U.S. Cl. 128—33 **14 Claims**



A vibrating machine for use in treating obstructive respiratory disorders, such as emphysema. The machine provides a table which is suspended from loops depending from an adjustable frame portion thereof. Means is provided for raising one end of the adjustable frame portion so as to tilt the table on which the patient is lying in a prone position with his head in a lowered position. In a preferred embodiment of the machine, a first control means provides for simultaneously varying the eccentricity of a pair of spaced rotating weights mounted below the table and thereby varying the intensity of the vibratory impulses imparted to the patient; and a second control means provides for varying the relative phase angle of the pair of rotating weights and thereby varying the direction of the vibratory impulses imparted to the patient.

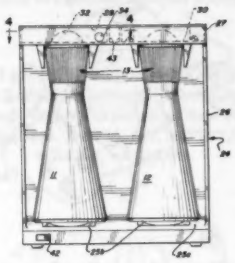
3,752,155

APPARATUS FOR HEATING OR COOLING A SURFACE WHILE SIMULTANEOUSLY DISPENSING A LIQUID PRODUCT THEREON

William Blinoff, Jr., 1332 Woodland Ln., Deerfield, Ill.; Robert A. De Napoli, 980 Sheridan Rd., Glencoe, Ill., and Richard Hart, 24WO51 North Ave., Wheaton, Ill.

Filed Jan. 4, 1972, Ser. No. 215,339
Int. Cl. A61h *15/02*; A46b *11/08*
U.S. Cl. 128—65 **9 Claims**

An apparatus is provided for either heating or cooling the skin surface while simultaneously dispensing a liquid product thereon. The apparatus includes a rotatably mounted mass of thermal energy storage material having a hardened, curved heat transfer exterior to which a film of the liquid product adheres when the mass rotates. The mass and the skin surface



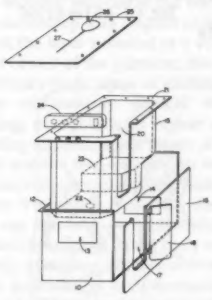
engaged thereby have disparate temperatures, thus producing either a hot or cold sensation on the skin surface when the mass is in rolling contact therewith and the product is being dispensed thereon.

3,752,156

THERAPY BATH CABINET

Reber B. Wack, Box 83, Watseka, Ill.

Filed May 19, 1972, Ser. No. 254,874
Int. Cl. A61h *9/00*
U.S. Cl. 128—66 **6 Claims**



A cabinet comprising an inner and outer preformed shell assembled into a unitary structure with a water tight side door. The inner shell includes an integrally formed seat for use by an occupant. The outer shell is spaced from the inner shell forming a chamber containing water conduits, pump and associated equipment. Control means permit an attendant or occupant to provide either a shower or bath and also a whirlpool effect.

3,752,157

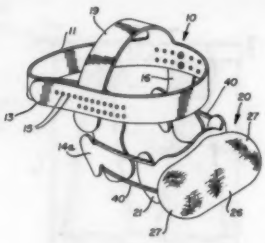
DISPOSABLE HEADBAND AND FILTER

Oscar Malmin, 127 E. Wayne Ave., Akron, Ohio

Filed Nov. 8, 1971, Ser. No. 196,405
Int. Cl. A61m *16/00*
U.S. Cl. 128—146.7 **6 Claims**

A disposable headband and filter bag for use by dentists, doctors and the like. The headband is stamped or cut from a single piece of paper or other similar lightweight, inexpensive material and has a base or head-encircling portion which is perforated at one end and which carries a series of buttons, snaps, projections, or other joining means at the other end. At approximately the midpoint of the blank a top strap integrally projects at substantially right angles, and this also has a plurality of apertures or holes. At about the midpoint of the headband, a supporting member or tab is provided which may be either integral with the band or removable. At one end also a

similar tab is provided. When folded or bent, the end with the button or other joining means is brought into engagement with the end with the apertures, and the buttons or joining means engage the apertures, with the presence of the plurality of



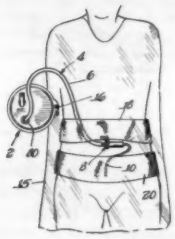
apertures making it possible to adjust for various head sizes. Similarly, the top strap is connected to the button and is also adjustable. A filter bag is provided and may be secured by strips of elastic or similar material which engage tabs on the filter and the aforementioned tabs on the headband itself.

3,752,158

APPARATUS AND METHOD FOR SUPRAPUBIC DRAINAGE OF THE URINARY BLADDER

Donald H. Kariher, St. John's, Antigua, British West Indies, assignor to Snyder Manufacturing Company, Inc., New Philadelphia, Ohio

Filed Nov. 23, 1970, Ser. No. 91,885
Int. Cl. A61m *01/00*
U.S. Cl. 128—278 **2 Claims**



Apparatus and method for suprapubic drainage of the urinary bladder comprises a small trocar for puncturing the bladder wall following which a flexible drainage tube is inserted through the lumen of the trocar and into the bladder. The trocar is then retracted from the patient and withdrawn from the tubing over the proximal end thereof. The proximal end of the tubing is then connected through a three way stopcock which is in turn connected to an additional piece of flexible tubing, the latter running to a portable suction-producing device which may be secured to the patient's garment. A fully closed evacuating system is provided. The stopcock has an auxiliary passageway into which a hypodermic needle may be inserted to irrigate or flush the system, or to introduce medication into the bladder.

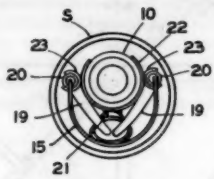
3,752,159

RESECTOSCOPE CUTTING ELECTRODE

Reinhold D. Wappler, New Canaan, Conn., assignor to American Cystoscope Makers, Inc., Pelham Manor, N.Y.

Filed May 3, 1971, Ser. No. 139,541
Int. Cl. A61b *17/32*
U.S. Cl. 128—303.15 **10 Claims**

A resectoscope including a tubular sheath; an optical telescope comprising a tubular stem within the sheath, an eyepiece at the proximal end of the stem and an objective lens at the distal end of the stem; and a cutting electrode carried by and reciprocable along the telescope stem and comprising a tubular body, an electrode wire including a rectilinear first part extending through and insulated from the inner surface of the tubular body, a generally loop-shaped second part extending beyond the distal end of the first part and having a pair of electrically insulated arms and an uninsulated cutting element constituting a continuation of each arm and positioned in the field of vision of the telescope. Mounted on the tubular body is



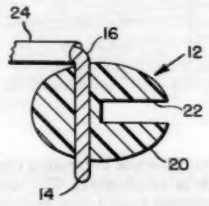
a saddle unit comprised of an arcuate first member secured to the body, an arcuate second member affixed to the first member and embracing the telescope stem and slidable therealong, and a pair of arcuate third members which are disposed and attached to opposite sides of the second member. A portion of each arm is retained in a corresponding third member whereby the arms are adequately supported and rendered more stable against undesirable flexing, bending and/or deformation.

3,752,160

DISPOSABLE ELECTRODE SWITCH

Arthur G. Billin, Rochester, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Filed July 15, 1971, Ser. No. 162,799
Int. Cl. A61b *17/36*; A61n *3/00*
U.S. Cl. 128—303.17 **1 Claim**



The invention is a disposable switch and conductor cord which clips on a forceps and connects the forceps to the working circuit of an electrosurgical device wherein any forceps made of a conducting material may be adapted for use as a cautery.

3,752,161

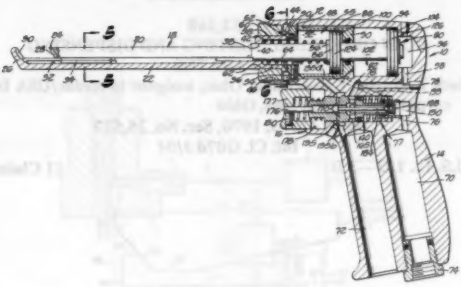
FLUID OPERATED SURGICAL TOOL

John H. Bent, Fullerton, Calif., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 2, 1971, Ser. No. 168,297
Int. Cl. A61b *17/16, 17/32*; F15b *11/10*
U.S. Cl. 128—312 **24 Claims**

A fluid operated surgical tool having a body to which variously configured object-engaging elements may be removably attached for gripping, cutting or perforating bone, tissue or other structures. Housed within the body is an assembly, responsive to fluids under pressure, for operating the object-engaging elements. A fluid regulating valve assembly is provided for precisely controlling the flow of fluids to the pressure-responsive assembly, so that the surgeon may deftly and accurately control the movement of the object-engaging elements. The fluid regulating valve assembly comprises a valve

seat through which fluid flows to the pressure-responsive assembly, a valve, an operator control for disengaging the valve from the valve seat, and an automatic pressure-balancing



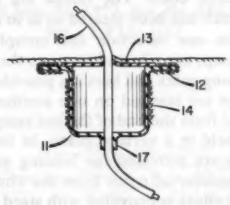
mechanism for moving the valve seat into reengagement with the valve to stop the flow of fluid therethrough when pressures acting on the pressure-responsive assembly reach predetermined levels.

3,752,162

ARTIFICIAL CUTANEOUS STOMA

Mahmoud S. Newash, Saginaw, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Apr. 10, 1972, Ser. No. 242,505
Int. Cl. A61m *25/02*
U.S. Cl. 128—348 **10 Claims**



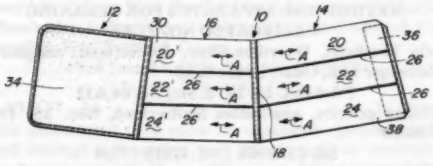
A device for providing a long term percutaneous pathway for elongated members such as catheters, pacemaker leads, fiber optics, and the like, comprising a flanged cup-shaped body containing coils of the elongated member or members and having tissue fixation means on its surface, at least one aperture in the bottom of the body through which the elongated members pass and to which the elongated member may be permanently affixed and a membranous cover designed to be cut along with overlying skin for withdrawal of the coiled portion of the elongated member after cutaneous implantation and healing.

3,752,163

BINDER

David Kaplan, 124 S. Main St., Sharon, Mass.

Filed Sept. 22, 1972, Ser. No. 291,349
Int. Cl. A41c *1/00*
U.S. Cl. 128—541 **3 Claims**



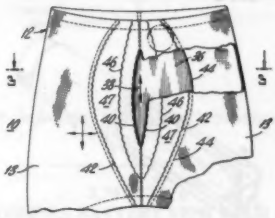
A body support comprising a body encircling member having a first section made of elastic webbing stretchable in the body encircling direction and a second section formed of a looped fabric and forming an extension of the first section to complete encirclement of the body. A narrow strip of fastener material having hook-like members is secured to the free end of the first section, and the hooks releasably lock on the loops of the looped fabric to close the member about the body.

3,752,164

GIRDLE WITH MULTI-REGION ABDOMINAL CONTROL

Sallyann Zanca Salisky, Washington Township, N.J., assignor to International Playtex Corporation, New York, N.Y.

Filed Sept. 2, 1971, Ser. No. 177,297
Int. Cl. A41c *1/00*
U.S. Cl. 128—547 **11 Claims**



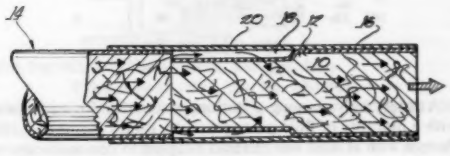
A girdle is disclosed which includes a body encircling region of two-way stretch material with said region having an opening in the front abdominal controlling portion thereof; and a layer of one-way stretch material secured to the body encircling region in overlying relationship with respect to the opening with the line of stretch of the layer oriented in a vertical direction. Starting at the front center of the garment, the girdle of the invention thereby includes three areas of abdominal control including; the layer of one-way vertical stretch material spanning the opening; a double layer region surrounding the opening and including superimposed layers of one-way vertical stretch material and the two-way stretch material; and the two-way stretch material comprising the body encircling region of the garment. Preferably, vertically distensible spaced apart lines of zig-zag stitching are employed to secure the layer of one-way stretch material to the body encircling region with the horizontally extending stitch portions of the zig-zag construction being increasingly and decreasingly modulated from an imaginary lineal base line to produce a scalloped effect which helps resist horizontal stresses which tend to shift the layers laterally with respect to one another.

3,752,165

SMOKE FILTER PLUG AND PROCESS AND CIGARETTE MADE THEREFROM

Gloria C. Harllee, 605 Muirs Chapel Rd., Greensboro, N.C., and John D. Woods, 3051 Magazine Dr., Winston-Salem, N.C.

Filed Dec. 20, 1971, Ser. No. 209,797
Int. Cl. A24d *01/04;* A24f *07/04, 13/06*
U.S. Cl. 131—10.5 **14 Claims**



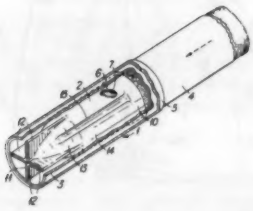
A porous filter plug for a smoking article comprising a tow of longitudinally extending fibers enclosed within a plug wrap and having a cavity molded in the outer surface at one end. The plug is formed by molding a conventional tow of ther-

moplastic filamentary material. In use, a portion of the smoke passes from end to end through the plug and the remainder passes through the channel formed by the cavity and then axially through the plug wrap and the plug.

3,752,166
TOBACCO SMOKE FILTER

Henry Lyon, Garuth; Harald David Mathewson, London; James Thomson Davidson Williamson, Radlett, and Stanley William Byrne, Newport Pagnelle, all of England, assignors to American Filtrona Corporation, Richmond, Va.

Filed Dec. 24, 1970, Ser. No. 101,295
Claims priority, application Great Britain, Dec. 24, 1969, 62,856/69; Mar. 21, 1970, 13,767/70
Int. Cl. A24d *01/04*; A24f *07/04*
U.S. Cl. 131—261 B **20 Claims**

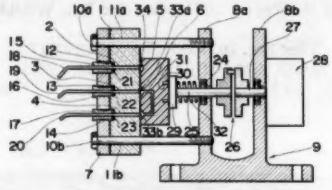


A tobacco smoke filter, particularly for use with cigarettes, has a high filtration efficiency and novel construction, at least one end of the filter having an appearance similar to conventional filters comprising cylinders packed with crimped filaments or creped paper. The filter comprises a tube within which is a rod having an outer wall of filtering material and an inner part of supporting material. At one end the rod has the same cross sectional shape as the tube and is in engagement with the tube around its periphery, at the other end or between the ends, its cross sectional shape changes so that opposed surfaces of the filtering material engage each other, so that tobacco smoke drawn through the filter is constrained to pass through the wall of filtering material. The filter has a high efficiency at an acceptable pressure drop.

3,752,167
FLUID SWITCHING DEVICE

Hideki Makabe, Nakakyo-ku, Kyoto, Japan, assignor to Shimadza Seisakusho Ltd., Kyoto, Japan

Filed June 30, 1971, Ser. No. 158,227
Claims priority, application Japan, July 7, 1970, 45/59688; July 28, 1970, 45/65998
Int. Cl. F16k *11/14*
U.S. Cl. 137—609 **9 Claims**

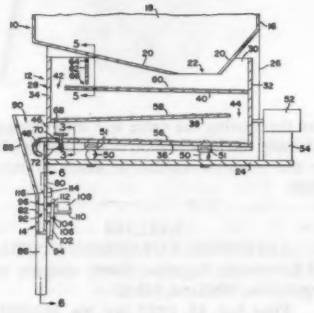


A rotary valve having a stationary member formed therein with a plurality of fluid passages and a rotary member formed therein with at least one channel adapted to communicate one of said fluid passages to another therethrough upon rotation of said rotary member. To facilitate a satisfactorily smooth rotation of said rotary member in contact with the stationary member, both the stationary member and the rotary member are made of materials of dissimilar quality having relatively higher and lower hardness, respectively, and, in addition thereto, the contact surfaces there of are polished very accurately.

3,752,168
COIN ORIENTING, SORTING AND DISPENSING APPARATUS

Jack E. Bayha, Chesterland, Ohio, assignor to Ardac/USA Incorporated, Chesterland, Ohio

Filed Apr. 3, 1970, Ser. No. 25,527
Int. Cl. G07d *3/04*
U.S. Cl. 133—3 D **11 Claims**



Randomly oriented coins are moved along a series of upwardly inclined ramps to orient the coins in a single plane and to separate stacked coins. The ramps are covered with a mohair fabric which has been treated so as to make it resistive of deformation in one direction and compliant in another direction. The ramps are vibrated to move the coins along the fabric. Non-jambing gates and bars are provided to assure that none of the coins are stacked on one another. The oriented coins are directed from the end of the last ramp into a chute in which they are held in a vertical plane. In one embodiment, retractable stops are provided for holding and dispensing a predetermined number of coins from the chute. In a second embodiment, the chute is provided with sized slots for sorting the coins by denominations. A limit switch is provided to stop the vibrator and, thus, the feeding of coins to the chute when the chute is filled.

3,752,169
STEEL PICKLING METHOD

Stewart E. Rauch, Jr., and Edward H. Mayer, both of Bethlehem, Pa., assignors to Bethlehem Steel Corporation, Bthlehem, Pa.

Division of Ser. No. 45,929, June 12, 1970, Pat. No. 3,660,253. This application Oct. 29, 1971, Ser. No. 194,065
Int. Cl. C23g *1/08*
U.S. Cl. 134—3 **4 Claims**

A method and bath for cleaning and conditioning steel prior to tinplating in which the strip is pickled in a dilute aqueous solution of nitric and sulfuric acids. The pickled strip, when tinplated, has improved corrosion resistance.

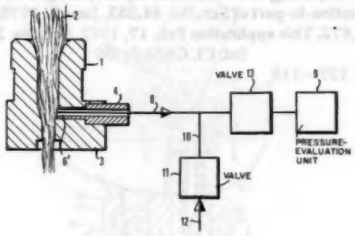
3,752,170
METHOD AND APPARATUS FOR CLEANING CALIBRATED NOZZLES

Erwin Murbach, Werrikon-Uster, Switzerland, assignor to Zellweger Ltd., Uster, Switzerland

Filed Oct. 25, 1970, Ser. No. 84,632
Claims priority, application Switzerland, Nov. 25, 1969, 17508/69
Int. Cl. B08b *5/02*; G01b *13/04*
U.S. Cl. 134—37 **7 Claims**

Method and apparatus for cleaning of calibrated nozzles for obtaining measurements corresponding to the substance

cross-section of a sliver of textile material, wherein the sliver is guided through a constricted nozzle with pneumatic pressure being evaluated as the measured quantity. The method of cleaning includes introducing a pressure surge into a measuring line leading to the nozzle with a pressure-evaluation unit so as to blow out deposits blocking the nozzle. The apparatus includes a second line leading into the measuring line and admitting a pressure surge into the measuirng line.

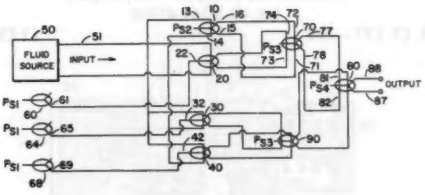


3,752,171

FLUID GAIN CHANGE CIRCUIT

Vernon H. Ayre, Falkville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 25, 1971, Ser. No. 156,784
Int. Cl. F15c *1/12*
U.S. Cl. 137—1 **6 Claims**



A fluidic gain change circuit is disclosed that produces a variable output pressure for providing an adjustable gain guidance and control circuit in response to gain changing signals. For a relatively fixed input signal at control ports, fluid amplifiers respond to a power jet change to couple discrete or digital change signals to a proportional output stage. This allows a differential fluidic output signal to increase or decrease by discrete steps of fluid flow levels.

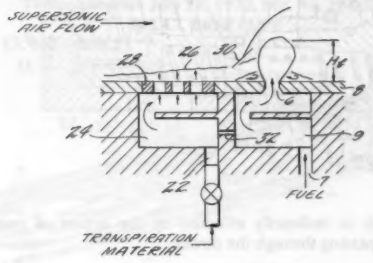
3,752,172

JET PENETRATION CONTROL

Leonard S. Cohen, West Hartford, and Lawrence J. Coulter, Manchester, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed June 14, 1971, Ser. No. 152,923
Int. Cl. F15c *1/08, 3/00*
U.S. Cl. 137—12 **15 Claims**

The penetration of a sonic or supersonic gaseous jet injected through a bounding wall into a sonic or supersonic cross flow is controlled by modification of the approach flow boundary layer. Penetration is increased when the separation pressure is reduced by disturbing the approach flow boundary layer. Both transpiration of small amounts of gas into the boundary layer, and positioning a trip or blockage element upstream of the injection station, will produce increased penetration.

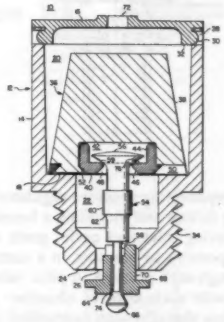


3,752,173

NONSPILL BATTERY VENT PLUG

David L. Karpal, Pomona, Calif., assignor to Teledyne, Inc., Los Angeles, Calif.

Filed Dec. 10, 1971, Ser. No. 206,729
Int. Cl. G05d *16/00*
U.S. Cl. 137—43 **9 Claims**



A nonspill battery vent plug is disclosed which includes a tiltable member which lifts a valve stem to close the plug whenever it is tilted. Improved means of connecting the valve stem and the weight member is provided to prevent fouling and malfunction.

3,752,174

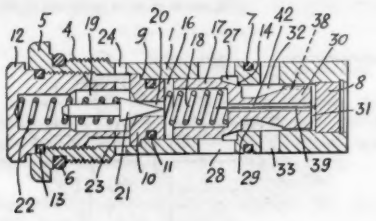
RELIEF VALVES

Marco Turolla, 213 Via Toscana, Bologna, Italy

Filed June 8, 1971, Ser. No. 150,968
Claims priority, application Italy, June 16, 1970, 12750 A/70
Int. Cl. F16k *31/36*
U.S. Cl. 137—491 **7 Claims**

A safety valve device of the kind provided with a throttle bore has the bore kept clean and free from impurities entrained in a fluid pressure medium passing through the device by a wire which is at least partly housed with clearance in the

throttle bore and which is so supported that relative longitudinal and transverse movement between the wire and the bore



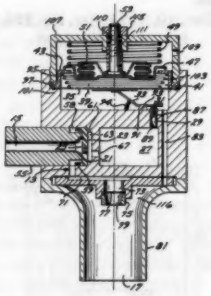
is directly or indirectly effected by the action of pressure medium passing through the device.

3,752,175

ALTITUDE COMPENSATING PRESSURE REGULATOR

Robert M. Hamilton, Brea, and Walter R. Anderson, Yorba Linda, Calif., assignors to Robertshaw Control Company, Richmond, Va.

Filed Aug. 20, 1971, Ser. No. 173,415
Int. Cl. F16k *17/36*
U.S. Cl. 137—81 **5 Claims**



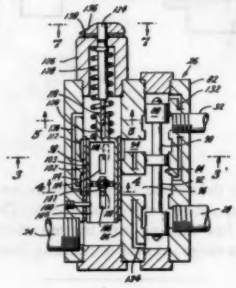
An altitude compensating pressure regulator for use with an aircraft breathing device and including a housing formed with a flow passage having inlet and outlet ports and including a control valve responsive to pressure in a control chamber to control flow through such passage. A pilot valve chamber is in communication with such control chamber by means of a passage having flow therethrough controlled by a pilot valve. One wall of the pilot chamber is in the form of a pressure responsive diaphragm which includes a bleed passage and is in engagement on one side with the pilot valve to effect control thereof. A reference chamber is formed on the opposite side of the diaphragm and is formed with an outlet having a reference valve seat formed therein. A reference valve poppet is disposed adjacent the reference valve seat and it is normally biased toward such seat by means of an override spring. Interposed between the override spring and the reference poppet is an aneroid having its exterior exposed to ambient pressure whereby the inlet may be connected with an oxygen supply and the outlet with a pilot's face mask and as the ambient pressure drops with increases in altitude, the aneroid will expand to move the reference poppet toward the reference valve seat to gradually increase the pressure in the reference chamber to adjust the pilot valve for decreasing the pressure in the control chamber to adjust the control valve and progressively increase the flow through the control passage. When a predetermined ambient pressure is reached, the aneroid will be totally relaxed and the pressure in the reference chamber will raise the reference valve poppet against the override spring off the reference valve seat to progressively increase the spacing between such poppet and seat with further decreases in ambient pressure to thereby adjust the control valve to maintain a substantially constant pressure in the control passage.

3,752,176

FLUID FLOW PROPORTIONING DEVICE

William Roy King, 1909 Sunshine Square, Longview, Tex.

Continuation-in-part of Ser. No. 44,383, June 8, 1970, Pat. No. 3,669,572. This application Feb. 17, 1972, Ser. No. 227,142
Int. Cl. G05d *11/00*
U.S. Cl. 137—118 **3 Claims**



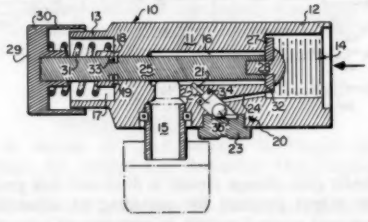
A proportioning device for maintaining a constant flow ratio to two separate outlets regardless of changes in the pressure of such outlets, in which the fluid pressure in each outlet is applied to a valve means to adjust the position of the valve means to compensate for pressure changes.

3,752,177

SELF VENTING VALVE

Robert A. Nordskog, 18135 Karen Dr., Tarzana, Calif.

Filed Nov. 8, 1971, Ser. No. 196,346
Int. Cl. F16k *45/00*
U.S. Cl. 137—216 **11 Claims**



A self-venting valve wherein a valve is interposed between an inlet and an outlet, a vent bypasses the valve and has a sealing means therein, the sealing means is adapted to open the vent allowing water to flow from the inlet to the outlet when the system operating pressure drops below a predetermined value.

3,752,178

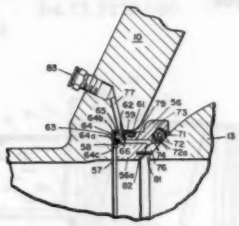
VALVE CONSTRUCTION

Marvin H. Grove, and Michael A. Karr, Jr., both of Houston, Tex., assignors to M & J Valve Company, Houston, Tex.

Filed May 15, 1972, Ser. No. 253,129
Int. Cl. F16k *5/22*
U.S. Cl. 137—246.22 **7 Claims**

A valve having at least one sealing assembly comprising a metal seat ring carried by the valve body and urged toward the valve member by circumferentially disposed coil springs. The springs are disposed within an annular retainer formed of

resilient material that is U-shaped in section and which seats within the body recess. The seat ring is sealed with respect to the body and carries resilient means for sealing with respect to



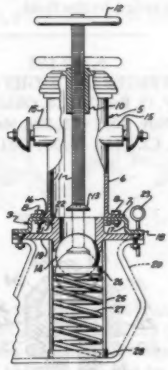
the valve working surface of the valve member. Preferably means is provided for injecting a viscous sealant into a region adjacent the sealing means, and means isalso provided for confining the viscous sealant to this region.

3,752,179

PORTABLE FIRE HYDRANT

Luther C. Atkins, and Jimmy G. Atkins, both of 5207 N. Villa, Space No. 7, Clovis, Calif.

Filed Mar. 9, 1971, Ser. No. 122,470
Int. Cl. E03b *9/02*
U.S. Cl. 137—272 **2 Claims**



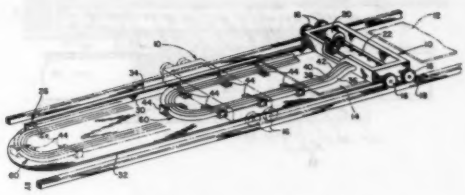
This invention consists of a vertically disposed steel or cast iron tubular member adapted to be bolted onto a support collar which in turn is secured by a key to a ball valve support flange that is bolted over an opening in a water main. The aforesaid tubular member is provided with both a plurality of horizontally disposed water outlets and a vertically disposed threaded rod whose upper end extends out of the top of the tubular member to terminate in the center of a hand wheel. The lower end of the aforesaid threaded rod is provided with a ball cup that presses down onto the top of a spring-loaded ball valve that is located in the lower end of the aforesaid ball valve support flange. The invention is adapted to be quickly removed from the top of the outlet of a water main at which time the water supply automatically will be shut off by the automatic action of the aforesaid spring-loaded ball valve.

3,752,180

RECIPROCATING MULTIPLE CONDUCTOR SUPPORT

Fred Grove Elder, Atwater, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 836,410, June 25, 1969, abandoned. This application July 24, 1972, Ser. No. 274,370
Int. Cl. B65h *75/36*
U.S. Cl. 137—355.17 **3 Claims**



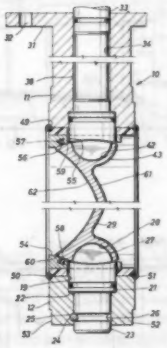
A horizontally reciprocating mechanism, including a plurality of attached, flexible conduits or conductors for carrying electricity, air or oil essential to operating certain devices, e.g. motors, and air and hydraulic cylinders, carried by the mechanism. A plurality of specially configured blocks or wearing shoes are secured to the conductors in spaced relation to maintain the conductors in a predetermined arrangement as they move along a horizontal pathway in response to reciprocation of the mechanism.

3,752,181

HIGH PRESSURE BUTTERFLY VALVE

William A. Morris, 2 Gessner Rd., Houston, Tex., and Samuel S. Clark, P.O. Box 795, Cleveland, Tex.

Filed Oct. 20, 1971, Ser. No. 190,751
Int. Cl. F16k *1/22*
U.S. Cl. 137—375 **11 Claims**

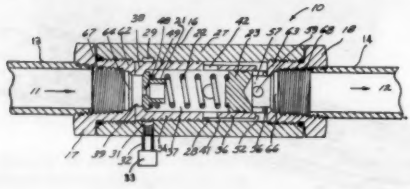


A high pressure butterfly valve having a pressure actuatable valve element that is flexed by fluid pressure to enhance the sealing ability of the valve in direct proportion to the pressure of the fluid controlled by the valve. The butterfly valve of this invention incorporates an annular seat element retained within the valve body by an upper valve actuating stem and a lower trunnion. A concavo-convex butterfly valve element is rotatably carried by the trunnion and valve actuating stem with the convex surface thereof facing upstream in the closed position. The valve element is capable of flexing responsive to application of fluid pressure in this manner as to expand the peripheral sealing surfaces thereof and enhance the mechanical sealing pressure as fluid pressure increases. The butterfly element also floats relative to the trunnion and valve stem thereby allowing the valve element to float or self-align itself to obtain optimum sealing engagement as pressure is applied by the fluid controlled by the valve.

3,752,182
PRESSURE COMPENSATED FLOW CONTROL VALVE

Glen Brand, 4114 N. 79th St., Omaha, Nebr.

Filed Apr. 21, 1971, Ser. No. 135,878
Int. Cl. F16k 31/12
U.S. Cl. 137—504 2 Claims

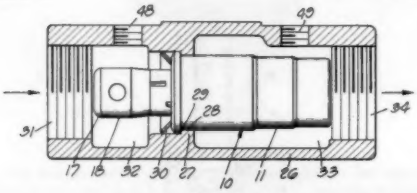


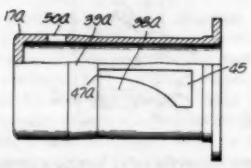
A valve for regulating the volume of fluid flow through a fluid line by the automatic movement of a cylindrical piston within a cylinder, the piston having an orifice in its one end and a plunger slidably disposed in its other end, the automatic movement being brought about by a pressure differential across the orifice and the regulation of flow being accomplished by the movement of the piston relative to the plunger.

3,752,183
FLOW VALVE HAVING TAPERED CUP

David E. Griswold, Corona, Del Mar, Calif., assignor to Griswold Controls, Santa Ana, Calif.

Filed Dec. 2, 1971, Ser. No. 204,022
Int. Cl. F16k 31/163, 31/36, 3/76
U.S. Cl. 137—504 8 Claims



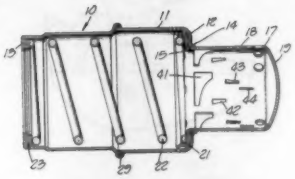


A flow control valve has a stationary member provided with an orifice plate together with a ported cup which slides within the opening in the orifice plate against the action of a spring, to provide substantially constant rate of flow under varying differential pressures across the cup. The ported cup has a generally cylindrical side wall and an end wall, the side wall having an outer surface comprising a first cylindrical surface near the end wall and a concentric second cylindrical surface axially spaced therefrom of smaller diameter, and a tapered surface joining the first and second cylindrical surfaces. Ports in the side wall extend through at least one of said cylindrical surfaces. This construction provides a minimum port area change which is lower than the range which can be obtained with the minimum width of a single port segment.

3,752,184
FLOW CONTROL VALVE

David E. Griswold, Corona Del Mar, Calif., assignor to Griswold Controls, Santa Ana, Calif.

Filed Dec. 2, 1971, Ser. No. 204,027
Int. Cl. F16k 31/12
U.S. Cl. 137—504 18 Claims

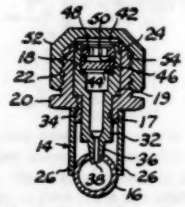


A flow control valve employs a ported cup which slides within an opening in a stationary member under increasing pressure differential and against the action of a spring, so that pressure differential changes have little or no effect on the rate of flow through the valve. A cylindrical side wall of the cup is provided with a plurality of axially extending duplicate series of circumferentially staggered separate port segments, the port segments in each of the series decreasing in circumferential width toward a closed end of the cup. Adjacent port segments in the series have end boundaries in substantially the same transverse plane normal to the cup axis, and one side boundary of each port segment in the series lies in a plane containing the axis of the cup. The shape and pattern of the port segments provide greater cup strength and minimize trapping of foreign objects carried by the fluid.

3,752,185
REFRIGERANT SIGHT GLASS

John W. Mullins, P. O. Box 20524, Oklahoma City, Okla.

Filed Nov. 10, 1971, Ser. No. 197,240
Int. Cl. F16k 43/00; G01f 15/06
U.S. Cl. 137—559 3 Claims



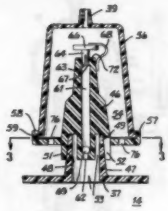
A generally cylindrical centrally bored housing is coaxially secured at one end portion within a short length of copper tubing. The other end of the copper tubing is contoured for connection with a fluid containing line. A tubular core, having a transparent disk closing its bore adjacent one end portion and a line piercing tip formed on its other end portion and having an overall length slightly less than the combined length of the housing and copper tubing, is coaxially received by the bore of the housing. A cap, removably engaged threadedly with the free end of the housing, forces the line piercing tip into the line and seals the core with the housing and the line.

3,752,186

VENTING DEVICE AND METHOD FOR ANESTHETIC ADMINISTRATION

Gale E. Dryden, Indianapolis, Ind., assignor to Dryden Corporation, Indianapolis, Ind.

Filed Oct. 9, 1970, Ser. No. 79,595
Int. Cl. F17d *1/00*
U.S. Cl. 137—608 7 Claims



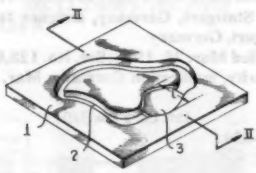
A valve assembly in a circle absorber system includes a removable plug to permit limited escape of gases from the absorber system, and a manually adjustable body accommodating escape of additional volumes of gas as determined by adjustable registry of vent openings therein. A valve assembly cover is provided with a fitting connectible to a vacuum system to facilitate disposition of vented gases outside of the operating room environment.

3,752,187

LAMINATED FLOW ELEMENT

David Arthur Retallick, Betzenweg 68, 8 Munich 60, Germany

Filed Nov. 10, 1971, Ser. No. 197,396
Claims priority, application Germany, Nov. 10, 1970, P 20 55 237.8
Int. Cl. F17d *1/00*; F15c *5/00*
U.S. Cl. 137—608 5 Claims



The invention concerns a flow element and method of making which consists of several plates stacked (layered) on top of each other having flow channels arranged therein and in which the number of layers is reduced by providing at least one channel completely enclosing a section of a plate. The above is accomplished by etching such a channel from both surfaces of a plate in which the channel is to be formed except in one region which is etched from one side only. A connecting web remains at this latter region and if a restriction is not desired in this region of the channel, the channel is made wider than the rest of the channel to the extent necessary to compensate for the lesser depth thereat.

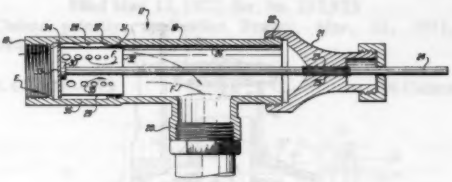
3,752,188

VALVE WITH CONTROLLED FLOW CHARACTERISTICS

Alexander Sage, 112 W. Jersey St., Elizabeth, N.J.

Filed Mar. 30, 1971, Ser. No. 129,489
Int. Cl. F16k *1/52*
U.S. Cl. 137—625.12 10 Claims

This disclosure relates to a valve having a cylindrical flow restricting element housed therein. Ports formed in the flow restricting element are progressively and cumulatively exposed to the flow of fluid thereby controlling flow through the valve. The ports are of a predetermined configuration such that the flow area varies as a characteristic function of the length of the axial movement of the flow restricting element.

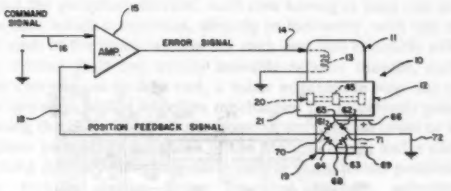


3,752,189

ELECTRICAL FEEDBACK SERVOVALVE

John A. Marr, and Robert H. Maskrey, both of East Aurora, N.Y., assignors to Moog Inc., East Aurora, N.Y.

Filed Sept. 15, 1971, Ser. No. 180,643
Int. Cl. F16k *11/07*
U.S. Cl. 137—625.65 11 Claims



An electrical feedback signal for an electrohydraulic servovalve is provided by electrical strain gauge means influenced by the bending of a cantilever beam one end of which is constrained to move in a frictionless manner with the output stage valve member of the servovalve, said strain gauge means including a strain sensitive element having a resistance value varied by bending of said beam thereby to generate an electrical feedback signal proportional to the displacement of said valve member which is operatively associated with the electrical command signal for the servovalve.

3,752,190

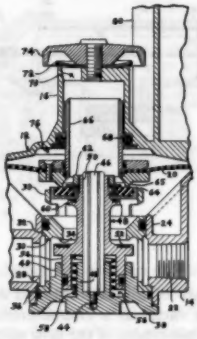
RELAY VALVE FOR TRACTOR TRAILER BRAKE SYSTEMS

Cecil Clifford Brake, Raleigh, N.C., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed Dec. 28, 1971, Ser. No. 213,034
Int. Cl. F16k *31/12*
U.S. Cl. 137—627.5 3 Claims

A relay valve for air systems in which a poppet valve member having seats for controlling respectively venting and supply is formed with an axial cylindrical bore and the valve housing has a polygonal shaft extending centrally upward,

received by the bore for precise guiding of the poppet and permitting communication between the opposite ends of the poppet to provide a balanced valve member making springs and other compensating means unnecessary.



3,752,191

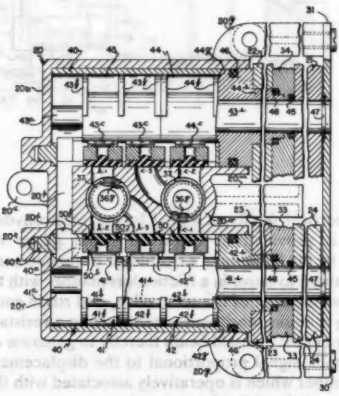
PUSH BUTTON MIXING VALVE

Irlin Botnick, 3155 Kersdale Rd., Pepper Pike, Ohio

Division of Ser. No. 782,798, Dec. 9, 1968, Pat. No. 3,658,094. This application Apr. 20, 1972, Ser. No. 246,072

Int. Cl. F16k *11/10*

U.S. Cl. 137—636.1 **11 Claims**



A push-button multi-temperature selection valve, having at least two parallel chamber bores and hot and cold water supply connections communicating variously through radial ports with the chambers, has valve members for the respective ports radially slideable in support sleeve structures, each inserted endwise as a sub-assembly in a bore; and within each bore at least one coaxially-stemmed either rotary or sliding camming type valve operator. Two operators, selecting flow solely from respective inlets, and at least one selecting mixing flow from both inlets are actuated by respective push-button mechanisms.

3,752,192

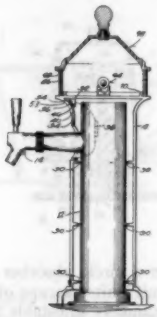
STANCHION FOR BEVERAGE TAP

Roland P. Kleppin, Greenfield, Wis., assignor to Display Corporation International, Milwaukee, Wis.

Filed Apr. 7, 1972, Ser. No. 242,123

Int. Cl. F16k *27/08, 27/12*

U.S. Cl. 137—802 **15 Claims**



A stanchion in two separable sections surrounds a vertical tap. A faucet opening is provided in the side wall of the stanchion at a joint between the separable sections. A detachable faucet plate is held in position in the faucet opening by interengagement between the plate and the separable sections when they are joined to form the stanchion. The tap faucet extends through an opening in the faucet plate. Faucet plates with different openings to accommodate taps with different numbers and arrangements of faucets can be fitted into the stanchion. The top of the stanchion is free to carry point of purchase advertising.

3,752,193

PNEUMATIC TWO-POSITION CONTROLLER

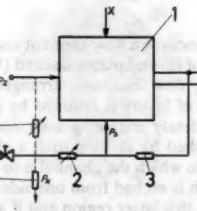
Horst Bader, Stuttgart, Germany, assignor to J. C. Eckardt A.G., Stuttgart, Germany

Filed Mar. 25, 1971, Ser. No. 128,063

Claims priority, application Germany, Mar. 25, 1970, P 20 14 307.1

Int. Cl. F15c *3/04*

U.S. Cl. 137—829 **16 Claims**



A pneumatic two-position controller in which the control point is adjusted pneumatically by means of a pressure distributor network connected between one output of a differential pressure amplifier and a source of auxiliary pressure, the pressure distributor network providing the control point pressure to one input of the differential pressure amplifier.

ERRATUM

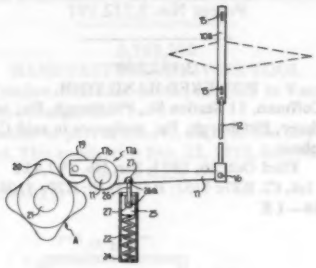
For Class 137—609 see:
Patent No. 3,752,167

3,752,194

LOOM SHEDDING MECHANISM

John Dalton Griffith, Littleover, Derby, England, assignor to Bonas Machine Company Limited, Staffordshire, Great Britain

Filed Feb. 29, 1972, Ser. No. 230,319
Int. Cl. D03d 5/00
U.S. Cl. 139—79 4 Claims



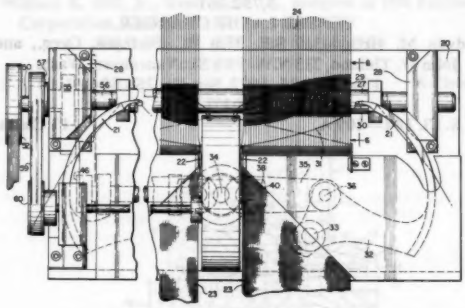
A heald shaft operating means for a heald shaft of a loom whereby the shaft is operably associated with a pivotal lever arranged to be driven in one directional sense by the action of a cooperating cam means acting upon a follower carried by the lever, and in the opposed directional sense by the action of a compression spring operably associated with the pivotal lever.

3,752,195

LOOM

Carl F. Libby, Stoughton, Mass., assignor to John D. Riordan and Gertrude C. Libby, Brockton, Mass., Trustees under Trust dated Oct. 13, 1955

Filed Mar. 23, 1970, Ser. No. 21,967
Int. Cl. D03d 47/46, 49/68
U.S. Cl. 139—124 A 11 Claims



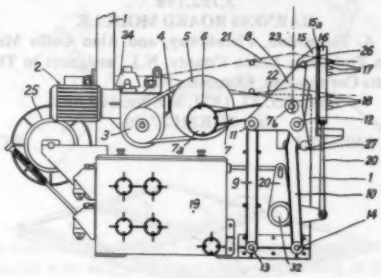
A shuttleless loom for simultaneously weaving two fabrics or webs independently of each other, but using a balanced common crank drive linkage with a flywheel to minimize inertial vibrations, a common knitting needle drive assembly, one needle for each fabric, a common rotating reed shaft with helically arranged beat-up dents, and a common power source. The knitting needles are held in a crank and pivot mechanism that causes the ends of the needle tips to move in a looped path that intersects the path of the weft-laying fingers to provide positive engagement of knitting needles and weft yarns, and the height of such looped paths are adjustable at their extremities by changes in the crank throw.

3,752,196

SLAY OPERATING MECHANISM FOR A LOOM

Jean-Jacques Hirsch, Neuilly; Eugene Mayeur, and Jacky Mayeur, both of Montreuil-Aux-Lions, all of France, assignors to Societe en Commandite par actions dite: Adolphe et Andre Caen, Paris, France

Filed Mar. 13, 1972, Ser. No. 233,923
Claims priority, application France, Mar. 12, 1971, 7108830
Int. Cl. D03d 43/04
U.S. Cl. 139—179 16 Claims



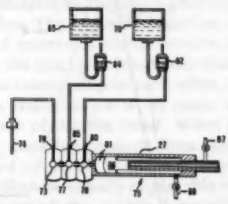
A slay operating mechanism for a loom comprises an operating rod adapted to be pivoted at one end to a slay; a bell crank lever, one arm of which is pivoted to the other end of the operating rod and the central portion of which is pivotally mounted on a shaft; a connecting rod pivoted at one of its ends to a second arm of the bell crank lever; an operating lever pivoted at one end to the other end of the connecting rod and at its other end to fixed structure; a beam pivoted intermediate its ends to the operating lever; two cams cooperating with the ends of the beam, each being mounted on a support shaft; a driving shaft for driving the cams; a Maltese cross for each cam and having at least four radial openings evenly distributed about the periphery thereof, each cam having at least one active face which cooperates, directly or indirectly, with one of the ends of the beam; an arm for each cam and rotatable with the driving shaft and axially movable relative thereto, each arm carrying, at its free end, a roller engageable into one of the openings and, a selection mechanism for selectively positioning the roller either in the plane of the Maltese cross or in a plane parallel to the plane of the Maltese cross; and a cam locking device for locking each cam in the selected position, the locking device being operated by the selection mechanism.

3,752,197

APPARATUS AND METHOD FOR FLUID HANDLING AND SAMPLE

William J. Ambrose, Springfield, Pa., and James F. McErlane, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 753,199, Aug. 16, 1968, Pat. No. 3,612,360. This application Mar. 4, 9171, Ser. No. 121,146
Int. Cl. B65b 3/04
U.S. Cl. 141—1 3 Claims



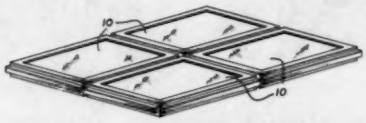
An apparatus and a method for handling and sampling fluids which comprises principally a nonpumping valve designed so

that in operation it moves less than a microliter of fluid, and a pumping valve designed to aspirate a precisely determined amount of fluid into the body of the valve with no more motion than is inherent in the operation of the valve itself and with no change in the physical dimensions of the valve. These valves, when used in combination with a transfer probe and a pump designed to handle minute quantities of fluid, form a precision fluid handling and sampling system which will not contaminate or dilute the fluid to be sampled.

3,752,198
HARNESS BOARD MODULE

Arthur A. Fiorentino, Piscataway, and Alan Collis McCree, Union Township, Union County, N.J., assignors to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Oct. 27, 1971, Ser. No. 193,082
Int. Cl. B21f 27/00
U.S. Cl. 140—92.1 **9 Claims**

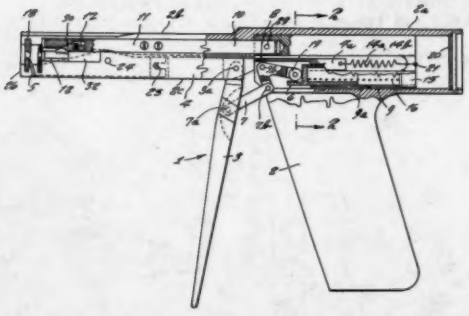


The invention is directed to harness board module coupling means for coupling such modules together to form a harness board of desired dimensions. A central retention means arranged to receive and retain therein harnessing aids is bounded on at least one of its four edges by a framing member to which is coupled a coupling means whereby similar harness board modules may be coupled one to another. The coupling members may be in the form of hermaphroditic hooks such that adjacent modules are placed in inverted relationship one to another. Magnets may be used as a coupling means, or by the use of dovetail slots, within the framing members and appropriately shaped coupling pins, respective modules may be coupled to one another. The framing member may be applied to the edges of the retention means by employing adhesive means or by the use of barbed projections engaging themselves within the surface of the retention means. Attentively, the framing member may also include extending portions which overlie a portion of the surface of the retention means providing complete framing for the retention means.

3,752,199
SEMI-AUTOMATIC TYING AND CUTTING TOOL FOR HARNESSING AND WIRE BUNDLING

Imre Fekete, Manville, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Dec. 29, 1971, Ser. No. 213,331
Int. Cl. B21f 9/02
U.S. Cl. 140—123.6 **6 Claims**



A manually operated semi-automatic tool for tying wire bundles with a plastic cable tie and cutting the tie a predetermined tension by the actuation of a trigger. The tool is of gun-like shape having a nose section of minimum dimension especially adopted for miniature harnessing. The mechanical components are especially designed to be contained in a housing shaped for more effective miniature harnessing operations common to modern electronic packaging.

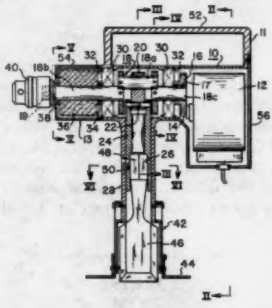
ERRATUM

For Class 141—1 see:
Patent No. 3,752,197

3,752,200
POWERED HAND TOOL

Oscar D. Coffman, 11 Station St., Pittsburgh, Pa., and Thomas W. Reichner, Pittsburgh, Pa., assignors to said Coffman, by said Reichner

Filed Oct. 26, 1971, Ser. No. 192,419
Int. Cl. B27c 9/02; B27f 5/10; B27c 3/08
U.S. Cl. 144—1 E **2 Claims**

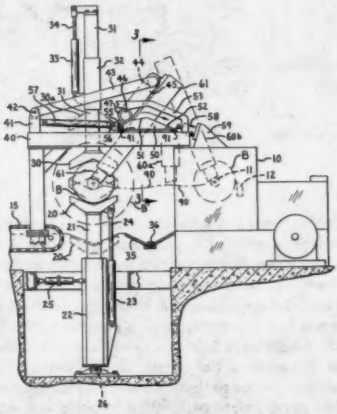


A housing with an elongated stem portion has a crankshaft mounted within the housing. A tool such as a saw or wood chipper extends through the elongated stem and is coupled to the shaft. An electric motor rotates the shaft causing reciprocal motion of the tool. A grinding wheel and a drill chuck are mounted on the shaft.

3,752,201
VENEER LATHE CHARGER

Edwin M. Heth, 4310 S.E. 35th Pl., Portland, Oreg., and John W. Tidland, 213 N.W. 94th St., Vancouver, Wash.

Filed May 25, 1972, Ser. No. 256,894
Int. Cl. B27l 5/04
U.S. Cl. 144—209 A **11 Claims**



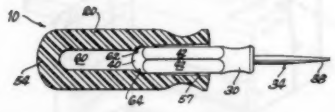
A simple linkage is provided for transferring cylindrical blocks of wood in horizontal movement from the yokes of a

pre-centering cradle to the chucks of a veneer lathe. The block is transferred by a pair of chucking arms which grip the ends of the block at points off center from the lathe chucking centers. The blocks are carried by the lower ends of the chucking arms which swing in a complex movement from overhead supporting mechanism. The movements of the chucking arms are controlled by wheels rolling on a pair of cam plates and a pair of link arms which together impart approximately straight line horizontal movement to the blocks instead of an undesirable arcuate path of movement.

3,752,202
HAND FASTENER DRIVING TOOL

Harry F. Condon, Hillsdale, Mich., assignor to Vaco Products Company, Chicago, Ill.

Continuation-in-part of Ser. No. 20,295, March 17, 1970, abandoned. This application Feb. 22, 1972, Ser. No. 227,880
Int. Cl. B25g 3/02
U.S. Cl. 145—61 L **14 Claims**

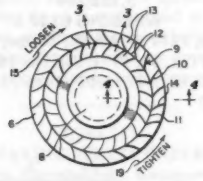


A hand driving tool, such as a screwdriver, comprising a torque magnifying handle and a headed bit. The handle defines a longitudinal bore to recieve the head of the headed bit. The bore is specially configured to minimize mechanical binding forces and to eliminate suctional resistance to bit removal without requiring the perforation of the head end of the handle.

3,752,203
LOCK-SCREW FASTENERS

William E. Hill, Jr., Rock Falls, Ill., assignor to Hill Fastener Corporation, Rock Falls, Ill.

Filed July 28, 1971, Ser. No. 166,764
Int. Cl. F16b 39/282
U.S. Cl. 151—37 **6 Claims**

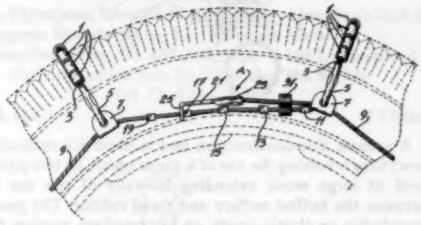


The present lock-screw fasteners involve the provision of a ring of inclined V or chevron-shaped locking projections on the under-side of an annular flange on the head of a lock-screw or a lock-nut, these projections being arranged so that the points, all of which are on a circle around the center line, are in trailing relation in the tightening of the screw or nut and are accordingly in leading relationship to take the best possible hold in turning in the opposite direction for a good locking action. In the tightening, razor sharp edges are swedged on the projections to increase the take-hold action to resist turning in a loosening direction.

3,752,204
CABLE TIRE CHAIN TENSIONING AND LOCKING DEVICE

Paul Rene Ouellette, deceased, late of P.O. Box 124, Lakewood Dr., Swanton, Vt. (by Yvonne Ouelette, legatee)

Filed Dec. 29, 1971, Ser. No. 213,500
Int. Cl. B60c 27/10
U.S. Cl. 152—219 **3 Claims**

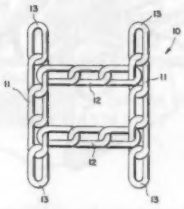


The disclosure describes a device for tensioning and locking the lateral wire of a cable tire chain comprising at least one abutment element fixed to one end portion of the lateral wire. The device also comprises a retaining member which is fixed at the other end of the lateral wire. The retaining member is formed with an opening through which the abutment element can be inserted, and means by which the abutment element abut the retaining member after the abutment element has been inserted through the opening in order to tension and lock the lateral wire.

3,752,205
CHAIN ASSEMBLY FOR IMPROVING TRACTION OF AUTOMOTIVE VEHICLES

Roger L. Gower, Room 302, 1911 Jefferson Davis Hwy., Arlington, Va.

Filed Apr. 12, 1971, Ser. No. 133,283
Int. Cl. B60c 27/00
U.S. Cl. 152—243 **2 Claims**

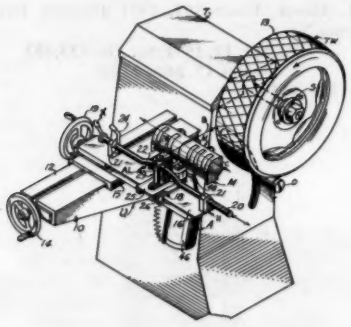


This invention comprises longitudinal and transverse lengths of chain fitted over the tread portion of an inflated tire. The links of chain forming the longitudinal portions of the assembly are bent out of plane in one direction, and the links forming the transverse portions are bent out of plane in the opposite direction. The opposite distortion of the links in the longitudinal and transverse chains ensures disposition of the chain flat upon the tire tread when said chains are assembled in perpendicular relationship to each other, and thus the traction side of the chain links is at all times in equal elevation above the surface of the tire tread. When lugs are attached upon the links, each lug projects from the face of the link which is disposed outwardly from the tread surface of the tire, and each lug is likewise equally engageable with the surface of the terrain over which the vehicle is travelling. Said longitudinal and transverse chains are assembled into units, and such units are connected to each other and to the side chains, to effect complete encirclement of the tire.

3,752,206
VENTED VEHICLE TIRE
Dean R. Hough, 3901 Nantasket St., Pittsburgh, Pa.
Filed Jan. 18, 1972, Ser. No. 218,757
Int. Cl. B60c 9/14, 19/00
U.S. Cl. 152—330 **7 Claims**

A vehicle tire construction and method for retreaded (or new) tires involving the use of a single patch, or two patches of cord of large mesh extending laterally of the tire casing between the buffed surface and tread rubber. The patch has stretchable or elastic cords, an intermediate portion thereof being connected to the cord ply layer of the casing and the ends projecting about half way or more of the sidewalls, and possibly as far as the beads, to vent air pockets which tend to accumulate. The patch makes use of the porous nature of the buffed surface.

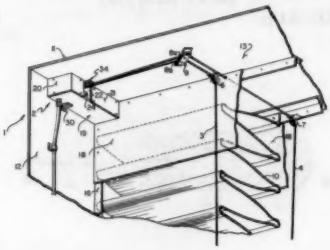
3,752,207
METHOD AND APPARATUS FOR STABILIZING
Norvel R. Branham, 2312 Armand Rd., N.E., and Peter C. Pantaze, 2378 Johnson Rd., N.E., both of Atlanta, Ga.
Continuation of Ser. No. 803,030, Feb. 27, 1969, abandoned. This application Apr. 5, 1971, Ser. No. 131,506
Int. Cl. B29h 21/01
U.S. Cl. 157—13 **12 Claims**



A method of and apparatus for stabilizing a vehicular wheel and tire assembly rotatable about an axis and having a circumferential tread which rolls along a surface wherein the method comprises the steps of rotating the wheel and tire assembly while simultaneously determining the radial deviations of the tread with respect to the axis at two or more points along a line across the tread parallel to the axis and rotating about the circumference of the wheel and tire assembly; correlating the determinations thus taken to indicate the curvature of the tread across its width and the irregularity of the tread produced by lateral runout, radial runout or a combination thereof; and subsequently cutting away portions of the tread to redefine the tread so that the irregularity of the tread is substantially eliminated and the curvature of the tread across its width remains the same.

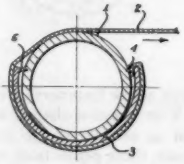
The apparatus includes an indicator mechanism, a cutter assembly and a control unit which mounts the indicator mechanism and cutter assembly adjacent the wheel and tire assembly. The indicator mechanism includes one indicator for measuring the radial runout along one edge of the tread, another indicator for measuring the radial runout along the opposite edge of the tread; and means for correlating the indicators to indicate the deviation of the radii across the tread. Another indicator may be provided for correlation with one of the above indicators to indicate the curvature of the tread across its width. The cutter assembly includes a cutter and the control unit includes guide means for controlling the cutter assembly.

3,752,208
CLOSURE OPERATOR
Frank D. Roberts, North Reading, Mass., assignor to Rixson-Firemark Inc., Franklin Park, Ill.
Filed Apr. 12, 1971, Ser. No. 132,959
Int. Cl. E05f 15/20
U.S. Cl. 160—1 **7 Claims**



A closure operator to effect remote, failsafe opening and closing of a damper, particularly a multi-fold or interlocking slat curtain damper. A frame or shell envelops a damper curtain which is capable of opening and closing an air passage through the frame or shell. A housing containing an electromechanical curtain operator is optionally positioned within or outside the frame or shell. The curtain is lifted by a tray connected to two wire cables, in response to the winding of the cable upon a takeup drum located within the housing. The principal components of the electromechanical curtain operator are a motor, planetary gear train and its associated latch mechanism which form a clutch, cable drum, speed control brake, and limit switch assembly. All of the foregoing components are protectively contained within an operator housing which is formed with an irregular shaped projecting finger which engages a mating opening formed in a damper supported bracket or in a baffle which isolates the curtain in its open position.

3,752,209
WEBBING CLIP
David A. Swanson, 1217 W. 4th St., Tempe, Ariz.
Filed Oct. 14, 1971, Ser. No. 189,142
Int. Cl. A47 13/01; A44b 21/00
U.S. Cl. 160—327 **5 Claims**



A C-shaped clip is disclosed for securing webbing to tubular framework. The clip is of resilient hardenable material and includes a plurality of teeth extending inwardly in a row at the extremity of each of the longitudinal sides. One end of a strip of webbing is inserted within the clip and impaled upon the prongs of one row. The webbing is then extended in a bight

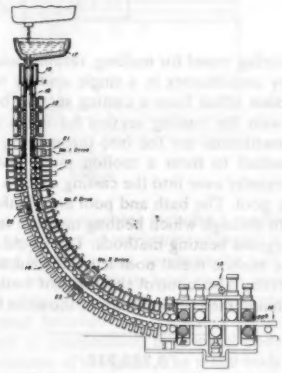
over the extremity of the clip and then along the outside of the clip. The clip and webbing is fitted onto the tubular framework such that each of the rows of prongs engage the tubular framework and the remaining portion of the clip is adjacent the tubular framework. The webbing is then wrapped about the clip, a portion of the exposed tubular framework and thence across the open space intermediate the framework. The force exerted upon the webbing disposed across the framework is translated to a force acting upon the rows of prongs to imbed them within the tubular framework, whereby the clip is inhibited from rotating and will securely fasten the webbing to the framework.

3,752,210

METHOD FOR CONTROLLING FORCES ON A STRAND AS IT SOLIDIFIES

Francis Gallucci, Irwin, and Frank Slamar, Monroeville, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Aug. 24, 1971, Ser. No. 174,350
Int. Cl. B22d *11/12*
U.S. Cl. 164—82 **5 Claims**



A method and mechanism for controlling the forces on a partially solidified strand formed in a continuous-casting operation. A speed-regulating tractive force is applied to the strand at a location in the line preceding that where the starter bar is disconnected. In apparatus utilizing a relatively long flexible starter bar, auxiliary tractive forces are applied at preceding locations. In apparatus utilizing a rigid starter bar or a relatively short flexible bar, the auxiliary tractive forces may be applied at locations following the speed-regulating force. The speed-regulating force is maintained at a predetermined maximum, and the auxiliary forces adjusted accordingly to supply the increasing force needed to move the strand, yet avoid excessive tensile or compressive stresses.

3,752,211

METHOD OF MAKING STRETCHABLE ZINC FIBERS

Yoshihiro Kuniyasu, Kawasaki-shi, Kanagawa-ken; Akio Matsumoto, and Eiji Isobe, both of Tokyo, all of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed Mar. 1, 1971, Ser. No. 119,870
Claims priority, application Japan, Dec. 15, 1970, 45/112126
Int. Cl. B22d *11/02*
U.S. Cl. 164—89 **1 Claim**

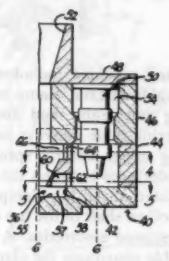
A zinc fiber having a superior stretching ability, which is prepared through the steps of: melting an ingot metal having a zinc content of 99.6 percent or more, extruding the resulting melt through a nozzle having a bore diameter in the range of 20–250μ by the use of an inert gas having a pressure in the range of 0.5–2.0 Kg/cm^2, and cooling the resulting extruded fiber by contacting it with an air current flowing crosswise of the fiber at a speed of 3–5 m/sec, said zinc fiber consisting essentially of zinc, having a diameter in the range of 20–250μ and having crystalline structure composed of crystals of zinc, the mean size of the crystals being substantially equal to the diameter of the fiber.

3,752,212

METHOD OF FORMING CASTINGS OF DIFFERENT METALS

Earl A. Thompson, Bloomfield Hills, Mich., assignor to Earl A. Thompson Manufacturing Co., Ferndale, Mich.

Continuation of Ser. No. 485,270, Sept. 7, 1965, abandoned.
This application July 20, 1970, Ser. No. 56,740
Int. Cl. B22d *23/00*
U.S. Cl. 164—93 **7 Claims**



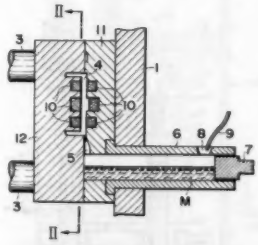
A second and different metal may be cast onto the solidified free surface of an otherwise still molten first cast metal which partially fills a mold cavity in such a way that said solidified surface forms a temporary barrier which remelts, autogenously uniting the metals into a composite cast product upon solidification. Vertical velocity in casting the upper metal should be minimized. Metal may be cooled in a lower gate to block flow therethrough to permit an upper gate in the same system to feed the mold.

3,752,213

OXYGEN FLUSH DIE CASTING METHOD AND APPARATUS

Isao Miki, Fuji, Japan, assignor to Nippon Light Metal Company Limited, Tokyo, Japan

Filed July 13, 1971, Ser. No. 162,153
Int. Cl. B22d *27/12*
U.S. Cl. 164—113 **9 Claims**



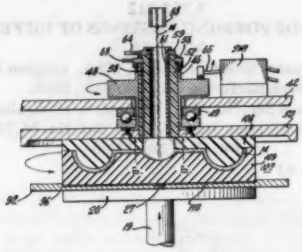
The invention is directed to a die casting method and apparatus wherein the shrinkage pores are concentrated in the unimportant regions of the product by positively retarding solidification of the cast metal in those regions so that the strength defects may be reduced in essential regions of the resultant product.

3,752,214

CENTRIFUGAL CASTING MACHINE HAVING MOLTEN METAL LEVEL DETECTOR

Alfred G. Pertot, 2 Yale Rd., Merrick, N.Y.

Filed Dec. 23, 1971, Ser. No. 211,268
Int. Cl. B22d *13/00*
U.S. Cl. 164—156 **17 Claims**



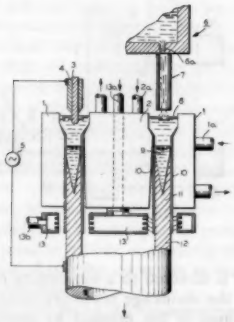
A centrifugal casting machine includes upper and lower rotatable axially movable coaxial clamp members the lower clamp member being engageable and disengageable with a drive motor. An indexing table conveys successive split centrifugal molds having upper central sprues and conductor members on their underfaces between the clamps. A molten metal reservoir is located above the clamps and has a valved nozzle directed to a hollow shaft of the top clamp which has at its bottom a pair of spaced electrodes. A swingable plate is located next to the table proximate the clamps. A control network including sensing switches and actuating devices is provided for raising the lower clamp to clamp the mold to the upper clamp, the restricting raising of the upper clamp causing the drive coupling between the motor and the lower clamp and thereafter the opening of the reservoir valve. Upon filling of the mold as sensed by the electrodes the valve is closed, the motor then disengaged and the lower clamp lowered. The sensing elements are shorted by an inverted mold conductor member to prevent valve opening, the absence of a mold as sensed by the excessive raising of the lower clamp terminates the cycle as does the sensing of metal centrifugally flung from the mold.

3,752,215

CONTINUOUS CASTING APPARATUS FOR SHAPED METAL BODIES

Kiyoshige Torikai, Mihara City, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 9, 1971, Ser. No. 196,972
Claims priority, application Japan, Nov. 12, 1970, 45/99057
Int. Cl. B22d *27/02, 11/10*
U.S. Cl. 164—252 **6 Claims**



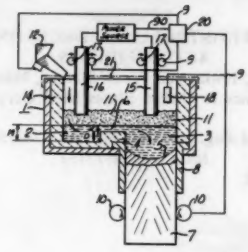
A slag bath is formed in the upper portion of a molding cavity formed between casting molds. Molten metal is poured into the molding cavity through the slag bath. Viscous slag films are formed by the slag bath between the casting molds and the metal. The metal is cooled through the slag films.

3,752,216

APPARATUS FOR HOMOGENEOUS REFINING AND CONTINUOUSLY CASTING METALS AND ALLOYS

Gale Ray Fritsche, Bradfordwoods, Pa., assignor to Sandel Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 824,589, May 14, 1969, Pat. No. 3,650,311. This application Dec. 27, 1971, Ser. No. 212,149
Int. Cl. B22d *27/02*
U.S. Cl. 164—252 **28 Claims**



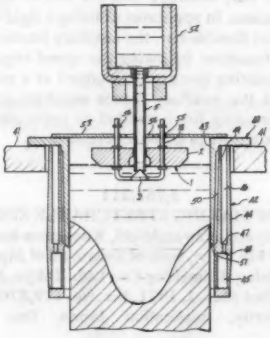
An electroslag vessel for melting, refining and continuously casting alloy constituents in a single unitary vessel having a melting section offset from a casting section being separated by a dam with the casting section having a casting throat. Metallic constituents are fed into the melting section where they are melted to form a molten metal bath and thence refined to transfer over into the casting section to form a molten metallic pool. The bath and pool are blanketed by a molten flux bath through which heating medium is applied, as by electro-energized heating methods. The liquid-solid interface between the molten metal pool is controlled as to shape and level to thereby also control the level of both the bath and pool to be maintained substantially at the same level.

3,752,217

FLOAT-DISTRIBUTOR FOR DIRECT CHILL CASTING

Peter E. Sevier, Woodbridge, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Aug. 13, 1971, Ser. No. 171,462
Int. Cl. B22d *11/10*
U.S. Cl. 164—281 **32 Claims**



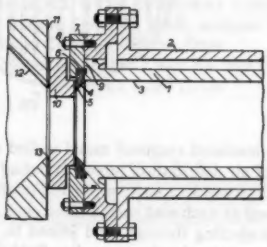
A float-distributor for direct chill casting of metals, particularly, aluminum and aluminum base alloys. The float-distributor comprises a float adapted to float on the surface of the molten metal in the mold. The float is adapted to fit about a feed nozzle which supplies the molten metal to the mold. Means for distributing the molten metal about the periphery of the mold is provided and is supported beneath the float. The distributing means generally comprises a cone shaped dis-

tributor which is supported in axial alignment with the feed nozzle. The apex angle of the distributor is generally kept between about 60° and 150°. The float may include means for increasing its buoyancy as the flow rate of molten metal issuing from the feed nozzle increases. The float may also contain means for preventing capillary flow of molten metal between the float and the feed nozzle.

3,752,218
CONTINUOUS CASTING MOULDS

Peter Charles David Gamble, Marton, and John Marsh, Fairfield, Stockton-on-Tees, both of England, assignors to Ashmore, Benson, Pease & Company Limited, Teeside, England

Continuation-in-part of Ser. No. 20,981, March 19, 1970, abandoned. This application Jan. 25, 1971, Ser. No. 109,312
Claims priority, application Great Britain, Mar. 21, 1969, 15,040/69
Int. Cl. B22d *11/10*
U.S. Cl. 164—281 **12 Claims**

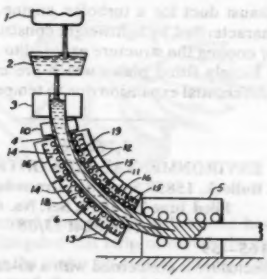


A continuous casting machine includes a tundish having an outlet defined by a body of refractory material, a mould of a material having high thermal conductivity and defining a mould passage arranged with its inlet end in communication with the outlet of the tundish and an apertured plate of silicon nitride positioned between the refractory material and the mould and held in compression by a metal body which surrounds the perimeter of the plate. The metal body is mounted in good heat transfer relationship with the mould.

3,752,219
STRAND GUIDE APPARATUS FOR CONTINUOUS CASTING

Max Burkhardt, Zurich, Switzerland; Horst Huber, Roselle Park, N.J., and Christian Chateau, Saint-Chamond, France, assignors to Concast AG, Zurich, Switzerland and Concast Incorporated, New York, N.Y.

Filed May 13, 1970, Ser. No. 36,764
Claims priority, application Switzerland, May 13, 1969, 7275/69
Int. Cl. B22d *11/12*
U.S. Cl. 164—282 **10 Claims**

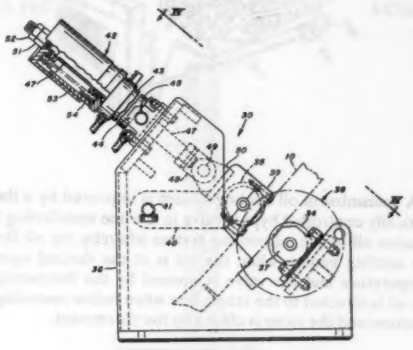


A guideway for the secondary cooling zone of curved type continuous casting plants in which guide rollers are carried in pivotally mounted yokes adapted to equalize the load on the guide rollers.

3,752,220
APPARATUS FOR RESTRAINING AN ABORTED CASTING IN A CONTINUOUS-CASTING MACHINE

Gottfried Hofmann, Pittsburgh, and George F. Schwartz, Allison Park, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Sept. 10, 1970, Ser. No. 71,037
Int. Cl. B22d *11/12*
U.S. Cl. 164—282 **10 Claims**

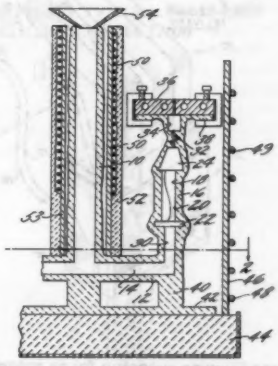


Structure for removing an aborted casting from a continuous-casting machine, in which machine the product is bent from the vertical to the horizontal. The aborted casting is cooled, notched, bent, moved downwardly, and removed. Apparatus is disclosed for restraining the descent of the aborted casting, and for controlling the depth of notches.

3,752,221
MOLD APPARATUS FOR CASTING WITH DOWNWARD UNIDIRECTIONAL SOLIDIFICATION

Stephen M. Copley, Madison, and Anthony F. Giamei, New Haven, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Division of Ser. No. 872,562, Oct. 30, 1969, Pat. No. 3,598,172. This application July 22, 1971, Ser. No. 165,302
Int. Cl. B22d *27/04*
U.S. Cl. 164—338 **5 Claims**



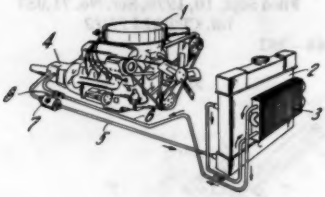
Unidirectionally solidified castings are produced by inverted solidification using a chill plate at the top of the mold and controlling the temperature gradient to cause solidification to occur from the top downwardly through the mold.

3,752,222

TRANSMISSION OIL COOLING SYSTEM

John H. Olbermann, Jr., 19 Thunderbird Park, Sierra Vista, Ariz.

Filed Nov. 18, 1971, Ser. No. 200,111
Int. Cl. G05d *23/00*
U.S. Cl. 165—35 2 Claims



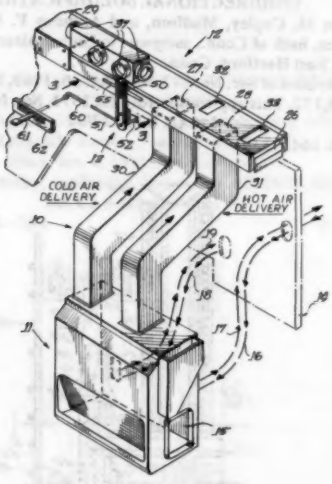
A transmission oil cooling system is improved by a thermostatically controlled bypass valve in the line transferring transmission oil to the oil cooling system whereby the oil flows to the cooling system when the oil is at the desired operating temperature and the valve is opened by the thermostat, but the oil is directed to the return line when below operating temperature and the valve is closed by the thermostat.

3,752,223

AIR CONDITIONING APPARATUS FOR AUTOMOTIVE VEHICLES

Kenneth W. Finch, Fort Wayne, Ind., assignor to International Harvester Company, Chicago, Ill.

Filed July 31, 1972, Ser. No. 276,504
Int. Cl. G60h *3/00*
U.S. Cl. 165—43 8 Claims



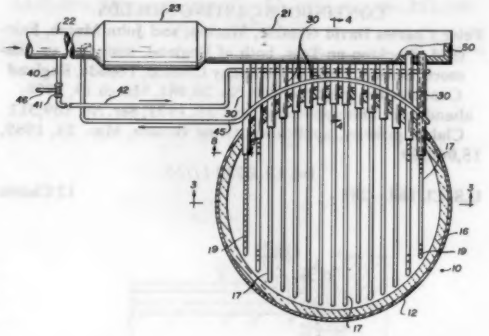
An air conditioning apparatus for an automotive vehicle including an air distribution duct assembly incorporating a pair of relatively slidably movable elongated ducts for distributing air to selected locations in the vehicle and utilizing a single lever to selectively open and close air discharge openings in the duct assembly.

3,752,224

JACKET COOLED HEADER AIR DISTRIBUTION SYSTEM FOR FLUIDIZED BED REACTOR

David Douglas Sproul, Villa Park, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Sept. 21, 1971, Ser. No. 182,378
Int. Cl. F27b *15/00*
U.S. Cl. 165—47 5 Claims



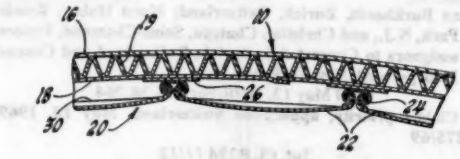
An internally insulated enclosed metal walled reactor having a plurality of air distribution pipes extending from an air manifold header to inside a bottom portion of the reactor, a jacket tube closed at each end surrounding each air distribution pipe and projecting through, and joined to, the reactor metal wall and means to circulate a cooling fluid through each jacket tube to control heat transfer from the air distribution pipes to the reactor metal wall.

3,752,225

DUCT FOR HOT GAS

Douglas Johnson, and Henry M. Mar, both of Indianapolis, Ind., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 42,679, June 2, 1970, Pat. No. 3,612,400.
This application May 5, 1971, Ser. No. 140,487
Int. Cl. F24h *3/00*
U.S. Cl. 165—47 3 Claims



An exhaust duct for a turbofan engine. The exhaust duct wall is characterized by lightweight construction and arrangements for cooling the structure exposed to hot gas. The wall is lined by loosely fitted plates which are corrugated so as to tolerate differential expansion due to temperature differences.

3,752,226

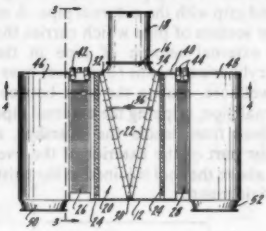
ENVIRONMENTAL AIR CONTROL UNIT

Oakle P. Bullock, 15858 Septo St., Granada Hills, Calif.

Filed June 25, 1970, Ser. No. 49,634
Int. Cl. F24f *13/08*
U.S. Cl. 165—59 24 Claims

This disclosure is concerned with a so-called environmental air control unit which is made up of a basic module which may include heating and cooling components, a directional controller structure, filters and appropriate connections, all of

which may be structured into various housings and shrouds with vortex generators and appropriate controls for discharging hot and cold air separately or together with a proportioning arrangement. The emphasis is on the basic module itself, but the housing, shrouding and vortex generators are important.

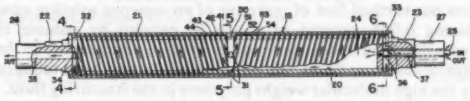


3,752,227

EMBOSSING ROLL WITH INTEGRAL COOLING MEANS

Douglas W. Bulson, Sylvania, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Filed Jan. 6, 1972, Ser. No. 215,746
Int. Cl. F28b *13/06*
U.S. Cl. 165—89 **3 Claims**



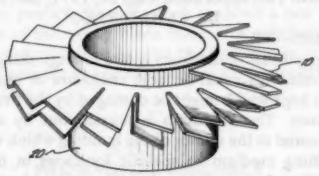
A heat transfer roll, such as an embossing roll, for use in connection with systems for continuously advancing a length of flexible sheet material while the material is subjected to thermal treatment. The roll turns with a wrap of the sheet material that passes therearound, and has a thin-walled cylindrical outer shell and a tubular cylindrical core tightly fitted within the shell with passages for cooling fluid defined therebetween. The passages are defined by helical grooves formed in the outer surface of the core, that progress axially in a plurality of closely spaced helical convolutions. Cooling water, for example, is circulated through the passages to cool the roll surface and the sheet material.

3,752,228

I-TYPE SEGMENTED FINNED TUBE

Robert Carl Bosse, Pryor, Okla., assignor to Escon Fintube Corporation, Pryor, Okla.

Continuation of Ser. No. 49,874, June 25, 1970, abandoned. This application July 13, 1972, Ser. No. 271,287
Int. Cl. F28b *1/36*
U.S. Cl. 165—184 **4 Claims**



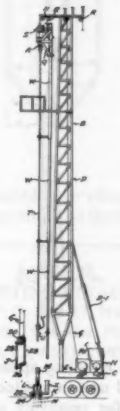
An I-type segmented finned tube is disclosed having a fin composed of an elongated flat strip of metal, the upper portion of which forms the major fin portion having a plurality of segmented fins formed thereon and extending radially outward therefrom. The lower portion of the flat strip forms the base which serves as a contact area for a welding electrode. The method of bonding the segmented fin to the tube is accomplished by an ultra-high frequency welding process which melts the root portion of the fin and the registering surface of the tube just prior to their mutual engagement. A force is then applied to the tips of the fins at the point of mutual engagement to forge the molten root portion of the fin to the molten surface of the tube to create a fused bond therebetween.

3,752,229

OIL WELL TUBING CLEANER

Whetstine B. Pridy, 861 Stevely Ave., Long Beach, Calif.

Filed Feb. 18, 1972, Ser. No. 227,470
Int. Cl. F21b *37/02, 19/00*
U.S. Cl. 166—72 **6 Claims**



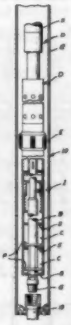
A power driven oil well tubing cleaner so operatively associated with a vehicle-supported tubing puller of the type that includes a vertically positionable mast that when a string of tubing is being sequentially moved upwardly in a well bore hole by the puller, each stand may have foreign material removed from the interior thereof by the cleaner prior to the stand being separated from the string.

3,752,230

PULLING TOOL

Henry A. Bernat, and William K. Murray, Bossier City, La., assignors to Tri-State Oil Tool Industries, Inc., Bossier City, La.

Filed June 21, 1971, Ser. No. 154,989
Int. Cl. E21b *31/00*
U.S. Cl. 166—98 **7 Claims**



A hydraulic pulling tool including inner and outer tubular members adapted for relative axial movement, hydraulic slips

on the outer member, a pipe grapple on the inner member, indicator valve means which are automatically opened at the completion of each pulling stroke to release pressurizing fluid to indicate completion of the stroke and dump valve means operable by vertical manipulation of the drill string to complete the release of pressurizing fluid.

3,752,231

APPARATUS FOR INSTALLING AND REMOVING FLOW CONTROL UNITS

Harold E. McGowen, Jr., and Ben D. Terral, Houston, Tex., assignors to Camcor, Incorporated, Houston, Tex.

Filed Mar. 27, 1972, Ser. No. 238,363
Int. Cl. E21b *7/06*
U.S. Cl. 166—117.5 **7 Claims**

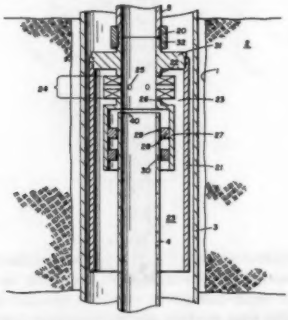
A flow control unit handling apparatus adapted for use in placing a flow control unit in a selected offset seat in a well tubing mandrel and for removing said unit therefrom. An elongate housing adapted to support a flow control unit and pivotally connected at its upper end to a supporting means for raising and lowering the housing in the well tubing and an elongated protective guide means pivotally supported from the housing allowing the apparatus to pass freely downwardly through an offset mandrel. A key for locating, positioning and tripping the apparatus into position to allow a valve to be placed or pulled from a selected offset seat. The apparatus being of a minimum elongate length such that the apparatus may pass through a curved tubing in a pump-down system.

3,752,232

WELL TOOL AND METHOD FOR USING SAME

Larry N. Bell; Charles R. Knowles, both of Anchorage, Alaska, and Frank M. Schuh, Dallas, Tex., assignors to Atlantic Richfield Company, New York, N.Y.

Filed Jan. 12, 1972, Ser. No. 217,362
Int. Cl. E21b *33/14*
U.S. Cl. 166—285 **5 Claims**



A tool for use in a wall such as a gas or oil well which comprises spaced apart inner and outer cylinders and means for admitting fluid from the interior of the inner cylinder to the annulus between the inner and outer cylinders, a cylindrical means (overshot) carried by the inner cylinder to extend over the outside of an external pipe already existing in the wellbore and to seal and grip with the external pipe. A method for connecting a new section of pipe which carries the above tool to an existing, external section of pipe in the wellbore by stabbing the cylindrical means (overshot) over one end of the pipe in the wellbore, sealing the joint between the overshot and the external pipe, gripping the external pipe so that it cannot be removed from inside the overshot, and cementing around at least part of the exterior of the overshot whereby the new pipe above the tool is joined to the existing pipe below the tool in a rigid manner.

3,752,233

HYDRAZINE OVERFLUSH TREATMENT IN HYDRAULIC FRACTURING

Marvin A. Svaldi, Morrison, and Bruce L. Knight, Littleton, both of Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Dec. 15, 1971, Ser. No. 208,461
Int. Cl. E21b *43/25, 43/26*
U.S. Cl. 166—308 **11 Claims**

Improved fracturing of subterranean reservoirs with fracturing fluids containing high molecular weight polymers, e.g., polyacrylamides, is obtained by first fracturing the formation with the fracturing fluid, and thereafter injecting 5–1,000 gallons per vertical foot of reservoir of an aqueous solution containing 0.005 percent to about 30 percent by volume of hydrazine. The hydrazine tends to increase permeability to the flow of reservoir fluids, the permeability having been reduced by the high molecular weight polymers in the fracturing fluid.

3,752,234

FIRE FIGHTING SYSTEM

Edward R. Degginger, and Thomas R. Steadman, both of Convent Station, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 081,517, Oct. 16, 1970, abandoned. This application Aug. 19, 1971, Ser. No. 173,269
Int. Cl. A62c *1/12, 3/02*
U.S. Cl. 169—1 A **8 Claims**

Aqueous dilatant solutions containing alkali metal borate, polyvinyl alcohol (PVA) and a fluorocarbon foaming agent are effective supressants for burning lighter than water organic liquids. The solubility of borate in water is enhanced by the use of a C_2 to C_{12} polyol. These dilatant solutions are most advantageously formed by combining streams of aqueous borate solution and aqueous PVA solution.

3,752,235

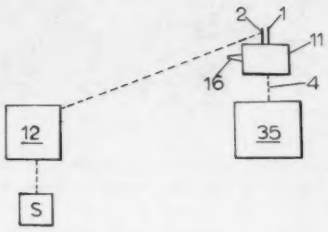
REMOTE CONTROLLED FIRE PROTECTION SYSTEM

Henry J. Witkowski, 5625 E. Lade Rd., Erie, Pa.

Continuation-in-part of Ser. No. 855,209, Sept. 4, 1969, abandoned. This application Aug. 24, 1971, Ser. No. 174,402
Int. Cl. A62c *35/00*
U.S. Cl. 169—2 R **3 Claims**

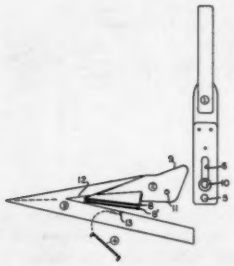
This specification discloses a fire extinguishing system for use in a relatively small or large enclosure or building where goods are kept which might be damaged by the fire extinguishing medium. The invention is carried out by a dispensing device located at the center of the building which will dispense extinguishing medium to specific locations in the building, thus avoiding damage to goods in the areas where there is no fire. The dispensing device is directed by a mechanism on the dispenser and a number of fire sensing devices located at the several areas to be protected. One of the fire sensing devices is located in each sector of the enclosure that is to be protected. These fire sensing devices may be, for example, in the form of a switch actuated by a thermostat or a photo cell or any device sensitive to heat or light, which will actuate a radio trans-

mitter. The signal from a transmitter can actuate a radio receiver which will in turn operate a motor or a direct wire controlled by a thermally actuated switching device, which



will drive the nozzle to a position where it will direct its material to the area of the building where the fire has occurred.

3,752,236
CHANGEABLE PLOW SWEEP
Clifford R. Foster, RFD 2, Avoca, Tex.
Filed May 19, 1971, Ser. No. 94,489
Int. Cl. A01b *15/00*
U.S. Cl. 172—751 **7 Claims**

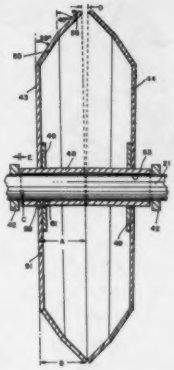


A changeable plow sweep comprising a shank adjustably affixed to a frog in a manner which enables the relative angle between V-shaped blades to the sweep and the frog to be adjusted.

The frog includes a laterally disposed groove formed in the forward edge portion thereof which receives a rear marginal edge portion of the sweep blade therein. A relatively flexible rod is abuttingly received against the frog and is placed into engagement with the sweep blades so as to removably affix the blade to the frog.

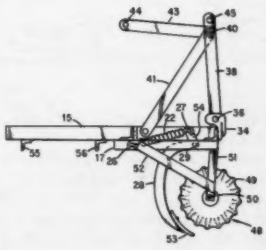
3,752,237
PRESS WHEEL ASSEMBLY
Michael C. Hornung, Spearville, Kans.
Continuation of Ser. No. 861,635, Sept. 29, 1969, abandoned.
This application Mar. 20, 1972, Ser. No. 236,208
Int. Cl. A01b *5/00*
U.S. Cl. 172—531 **3 Claims**

This invention relates to a press wheel means to be mounted upon a cultivating implement utilized in a seed planting process. More particularly, this invention is an improved press wheel assembly having cooperating half wheel assemblies loosely mounted upon a main support shaft and constructed so



as to create a constant wobbling or vibrating effect to maintain the same free and clear of mud and the like.

3,752,238
SOD PLANTING ATTACHMENT
Gustavous W. Chilton, P. O. Box 27, Wartburg, Tenn.
Filed July 30, 1971, Ser. No. 167,603
Int. Cl. A01b *49/02*
U.S. Cl. 172—180 **1 Claim**

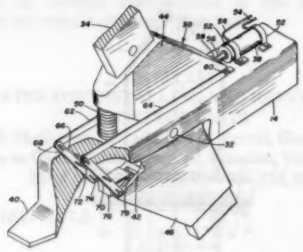


An attachment for conventional seed planters which permits the planting of crop seed in sodded areas which may have been undisturbed for as many as 20 years. The attachment is self-drafting; that is, no load weight must be applied to bring about proper ground preparation. The essential components are a semi-rigid curved foot immediately following a fluted disk colter. These are supported below a frame which has provisions for adjusting row width and has connections for standard three-point tractor hitches and corresponding attaching points on a seed planter unit.

3,752,239
VARIABLE RIPPER PLOW SHANK ASSEMBLY
Leon O. Kelley, P.O. Box 488, Stamford, Tex.
Filed June 1, 1971, Ser. No. 148,727
Int. Cl. A01b *13/08*
U.S. Cl. 172—699 **11 Claims**

A variable plow shank positioning assembly for use on a variety of plows. The assembly includes a shank support member pivotally mounted in a plow and including an aperture therein for rigidly receiving a plow shank. Wedges are slideably moveable by a hydraulic cylinder to abut with upper

and lower pads pivoted on the shank support member to selectively pivot the support member relative to the plow. A spring



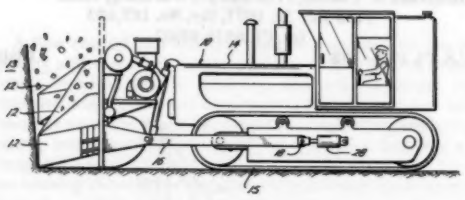
is disposed to normally bias the shank support member in a predetermined angular orientation.

3,752,240

METHOD OF AND APPARATUS FOR PROVIDING AN IMPACT TO A VEHICLED CARRIED PENETRATING TOOL

Charles D. Wood, III, San Antonio, and John M. Clark, Jr., Seguin, both of Tex., assignors to Southwest Research Institute. San Antonio, Tex.

Filed Dec. 23, 1971, Ser. No. 211,282
Int. Cl. E02f *1/00, 3/76*
U.S. Cl. 173—1 **5 Claims**



Providing an impact force on the push arm of a material penetrating tool by the tool carrying vehicle. A cutting tool slidably connected to a tractor in a generally longitudinal direction which is extended and held forwardly of the tractor by hydraulic cylinders which are released as the tractor is pushing the tool forwardly whereby the tractor will move forward and impact the tool push arms greatly increasing the thrust on the tool. A material moving combustion chamber slidably and releasably carried by a tractor and having a hydraulic piston and cylinder assembly for extending and holding the chamber in front of the vehicle and hydraulic control means for slowly releasing the hydraulic pressure when the chamber is fired to absorb the recoil of the chamber explosion.

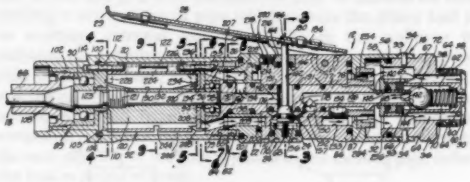
3,752,241

PNEUMATIC TOOL

John H. Bent, Fullerton, Calif., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed June 29, 1971, Ser. No. 157,933
Int. Cl. A61b *17/32*; A61c *1/02*
U.S. Cl. 173—163 **20 Claims**

A pneumatically operated surgical tool for driving various types of surgical attachments and cutters comprising a hand-held instrument which may be interconnected with a pneumatic supply and exhaust conduit for conducting gases under pressure to and away from the instrument. The hand-held instrument comprises, in coaxial alignment, a spindle rotatably driven by a pneumatic motor and a gas channeling conduit for channeling gases from the supply conduit to the pneumatic motor. Coarse and fine control valves for regulating the direction and speed of rotation of the pneumatic motor are structurally supported by the gas channeling conduit. The pneumatic supply and exhaust conduit is provided with a clo-



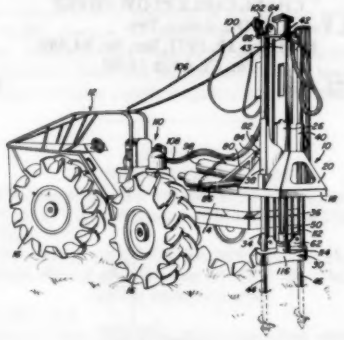
sure valve which automatically prevents a flow of gas therethrough when it is disconnected from the hand-held instrument.

3,752,242

HYDRAULICALLY ACTUATED CAVITY FORMING DEVICE

Ernest J. Gremillion, P.O. Box 11-K, Cut Off, La.

Filed Nov. 16, 1971, Ser. No. 199,121
Int. Cl. E21c *5/06, 5/11*
U.S. Cl. 175—108 **12 Claims**



A pair of longitudinally movable stems supported for generally vertical movement by a supporting and guiding structure on a mobile vehicle with the stems being extended and retracted by a unique actuating mechanism in the form of a hydraulically powered piston and cylinder assembly and an overdrive driving connecting with the stems for moving the stems a longitudinal distance twice the longitudinal extension and retraction of the piston and cylinder assembly. A hydraulic motor is provided for rotating the stems which are hollow and provided with an auger flight on the lower end thereof to facilitate insertion into the ground surface after which the stems may be slightly elevated to form an underground cavity into which an explosive charge may be introduced through the hollow stems for detonation, such as is employed in determining underground formations in underground surveys.

3,752,243

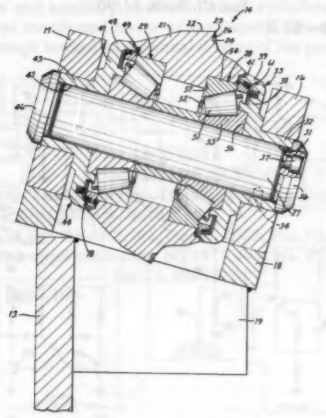
ROLLER CUTTER ASSEMBLY WITH IMPROVED BEARING SEAL RING

Herbert B. Hummer; Donald P. Jackson, and Rex E. Hall, all of Kalamazoo, Mich., assignors to Durametallic Corporation, Kalamazoo, Mich.

Filed Sept. 20, 1971, Ser. No. 181,820
Int. Cl. E21b *9/08*
U.S. Cl. 175—364 **3 Claims**

An improved seal assembly, and a method of manufacturing same, for use in a rock cutter assembly of a tunneling machine. The cutter assembly includes a rotary cutter

rotatably mounted on a frame by anti-friction bearings. Seal means coact between the frame and the cutter for preventing undesirable materials from contacting the bearings. The seal means includes a seal ring resiliently urged into sliding sealing engagement with the outer race of the anti-friction bearing. The seal ring is provided with a thin ceramic layer defining the



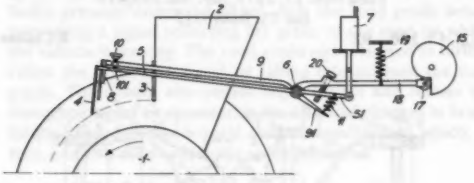
sealing face thereof. The end surface of the bearing race is lapped as a seal face by a special lapping tool which comprises an annular plate-like member having an annular ring-like lapping surface on the axial face thereof adjacent the periphery of the tool. The lapping surface surrounds an annular groove formed in the tool.

3,752,244

WEIGHT-MEASURING UNIT

Basile Rouban, Clamart, France, assignor to Trayvou S.A., Val de Marne, France

Filed July 20, 1972, Ser. No. 273,643
Claims priority, application France, July 21, 1971, 7126731
Int. Cl. G01g *13/02*
U.S. Cl. 177—1 **14 Claims**



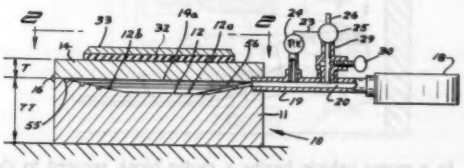
A two stage method of performing weighings of repeated dosages of granulated or powdered material in which the variations in "surplus" of the dosages are reduced by modulating, in dependence on the time taken by a "predosage" step, the rate of volume flow of the material to a weight sensing device during a second or "balance quantity" step, so as to obtain from one weighing operation to the next a substantially constant rate of flow of material by weight during the "balance quantity" step. A device for weighing repeated dosages is also described. This has a hopper adjacent the exit of which is mounted a rotatable metering drum for feeding material to a weight sensing device. A screen having an opening therein can be brought at the end of the "predosage" step into contact with the drum in order to reduce the rate of volume flow of material to the weight sensing device during the "balance quantity" step. A shutter can be adjusted relative to the screen to vary the size of the opening and is arranged to move with the screen. A cam is rotated from a start position at the beginning of each weighing operation and is stopped at the end of the "predosage" step. This cam controls the adjustment of the shutter relative to the screen and thus effects the desired modulation of the rate of flow of material by volume during the "balance quantity" step.

3,752,245

SCALE APPARATUS

Berthuld Thomas Johnson, 1551 97th St., North Battleford, Saskatchewan, Canada

Filed Apr. 17, 1972, Ser. No. 244,668
Int. Cl. G01g *5/04*
U.S. Cl. 177—208 **13 Claims**



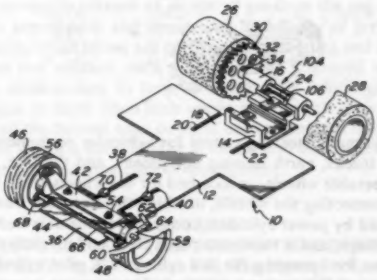
Scale apparatus that includes a base plate having an upwardly opening shallow generally conical or frusto conical recess, a second plate having a bottom flat surface, a weld seam for attaching the plates in abutting relationship at their adjacent peripheral edges whereby said recess and flat surface form a liquid chamber, a fitting attached to said plates and mounting a pressure gauge to measure the liquid pressure in said chamber, a reserve tank at a higher elevation than said chamber, a line having a pressure relief valve for fluidly connecting the tank to the fitting, a line having a hand operated valve connecting the tank to the fitting, a resilient pad mounted on the second plate and a reinforcing plate mounted on the pad. A ramp may be pivotally mounted on a hemisphere member that in turn is mounted on the reinforcing plate whereby the dual wheels may be driven onto the ramp with one wheel on each side of the hemisphere member.

3,752,246

RACING CAR

Matthew A. Sullivan, Elkins Park, Pa., assignor to Sullivan Products, Inc., Willow Grove, Pa.

Filed June 28, 1971, Ser. No. 157,561
Int. Cl. A63h *17/26*
U.S. Cl. 180—56 **9 Claims**



A radio control racing car having a resilient suspension system which is adjustable is provided. The wheels of the car are permitted to flex substantially independently of each other with a positive control provided for the amount of flexibility of each wheel. A motor mount is provided which permits the motor to be fixedly clamped into its desired operative position.

3,752,247

ARRANGEMENT OF A DRIVING MEANS IN THE FRONT PORTION OF A VEHICLE, SUCH AS A MOTOR VEHICLE

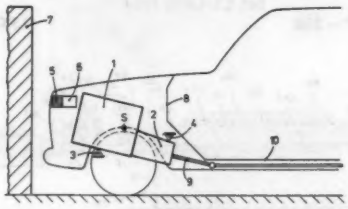
Kurt Schwenk, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Nov. 8, 1971, Ser. No. 196,419

Claims priority, application Germany, Nov. 14, 1970, P 20 56 102.8

Int. Cl. B60k *5/12*

U.S. Cl. 180—64 R 14 Claims



In a motor vehicle having a motor block secured to the chassis in a front portion of the vehicle, means projecting along the direction of travelling associated with the motor block and arranged above the center of gravity of the motor block, the arrangement of the projecting means and the securing members being such that during an impact having a certain force magnitude effecting the projecting means causes the motor block to rotate with its end facing the passenger cabin of the vehicle downwardly towards the road by creating a rotational momentum pivoting the block downwardly.

3,752,248

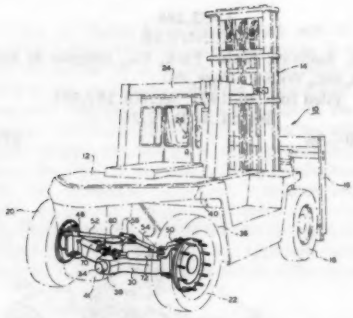
HYDRAULIC STEERING SYSTEM

Daryl Stevens, Battle Creek, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Aug. 31, 1971, Ser. No. 176,562

Int. Cl. B62d *5/06*

U.S. Cl. 180—79.2 R 12 Claims



A hydraulic steering system for vehicular equipment, such as lift trucks, earth moving equipment, and the like, having two steerable wheels, an axle bed for the wheels and a linkage interconnecting the wheels, in which the steerable wheels are operated by power cylinders connected to the axle bed and to the linkage, and a valve controls a fluid under relatively high pressure for operating the two cylinders. A pilot cylinder normally operating under a relatively low pressure is controlled by a remotely positioned metering pump responsive to the operation of the steering wheel by the operator. The pilot cylinder is connected to the linkage and to the steering valve to provide a follow-up effect through the pilot cylinder and steering valve. This system permits the use of a relatively high pressure sub-system for operating the power cylinders and a relatively low pressure sub-system controlled by the operator at a position remote from the steering mechanism for controlling the power cylinders.

3,752,249

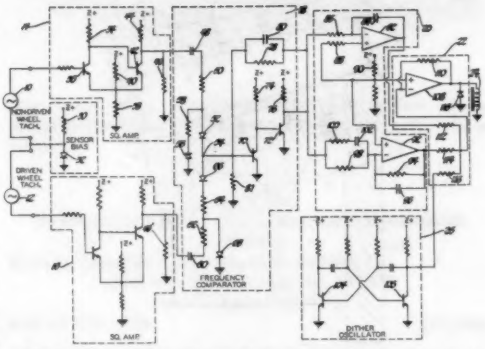
COMBINED WHEEL SLIP LIMITING AND VEHICLE SPEED LIMITING APPARATUS

Robert B. Gelenius, Davison, and Wayne A. Levijoki, Flushing, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 27, 1971, Ser. No. 175,629

Int. Cl. B60k *31/00*

U.S. Cl. 180—82 R 3 Claims



Maximum traction of a vehicle during acceleration is assured by a circuit responsive to signals from driven and non-driven wheel transducers including a frequency comparator for determining the difference in wheel speeds and an electro-vacuum servo motor in the engine throttle linkage responsive to a predetermined wheel speed difference for reducing engine torque output upon excessive slipping of the driven wheels. The non-driven wheel speed signal is limited to a maximum at a predetermined speed so that at higher vehicle speeds a simulated wheel slip signal is generated to reduce engine torque and limit vehicle speed.

3,752,250

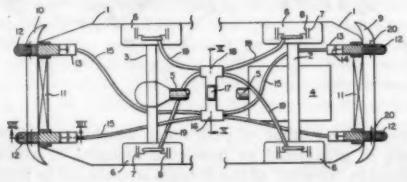
MOTOR VEHICLE AUTOMATIC IMPACT BRAKING SYSTEM

Eugene Speer, 401 Jennie Jewel Dr., Orlando, Fla.

Filed Nov. 17, 1971, Ser. No. 199,419

Int. Cl. B60t *7/12*

U.S. Cl. 180—92 8 Claims



The system automatically actuates the standard otherwise operator controlled wheel brakes of a motor vehicle upon impact to either longitudinal end of the vehicle. The impact may be delivered directly to projections, two for each bumper, that extend freely through the vehicle bumper for a considerable distance beyond the confines of the bumper so that with a head-on collision the brakes will be actuated before there is contact with the bumper, or with a collision from the side the bumpers, which are elastically connected to the vehicle frame, will elastically deform a substantial extent in the longitudinal and transverse direction before a longitudinal lost motion connection between the bumper and projections drivingly connects the two for actuating the brakes upon further longitudinal movement of the bumper and projection as a unit. In

either event, longitudinal inward movement of the projection, through the intermediary of a coil spring, will contract an expansible chamber, one associated with each projection, to pressurize fluid within a line leading to a balancing chamber having a fluid output connected to each of the wheel brakes. The wheel brakes are provided with conventional hydraulic wheel cylinders to be pressurized selectively by the vehicle operator and auxiliary hydraulic wheel cylinders to be pressurized as mentioned above automatically in response to impact through inward longitudinal driving of the projections.

3,752,251

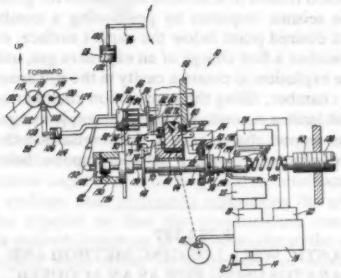
ROAD GRADE SENSOR

Edward G. Gaeke, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 883,386, Dec. 9, 1969, Pat. No. 3,632,176. This application Aug. 17, 1971, Ser. No. 172,507

Int. Cl. B60t *8/16*

U.S. Cl. 180—104 **2 Claims**



A vehicle wheel brake system in which vehicle and wheel speed signals are generated and utilized to generate a wheel brake pressure command signal, with the road grade sensor generating a signal reflecting the grade of the road on which the vehicle is moving. The road grade signal is used to further refine the command signal by taking into account the road grade. The system also senses brake torque and refines the command signal by considering the effect of changes in brake torque. The command signal controls mechanism, which, in turn, controls the wheel brake apply pressures.

3,752,252

METHOD AND APPARATUS FOR CONTROL OF A VEHICLE CONSTANT SPEED MECHANISM

Naoji Sakakibara, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi Prefecture, Japan

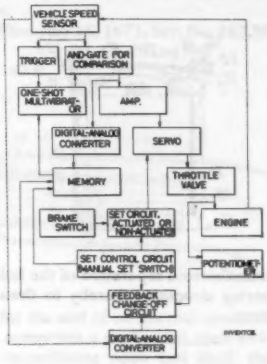
Filed July 6, 1971, Ser. No. 159,969

Claims priority, application Japan, July 3, 1970, 45/58594; July 3, 1970, 45/58595

Int. Cl. B60k *31/00*

U.S. Cl. 180—105 E **7 Claims**

A method and apparatus for control of a vehicle at constant speed. An actual vehicle speed signal is developed and when it is desired to operate the vehicle continuously at this actual speed, the actual speed is stored in a memory. A negative feedback signal responsive to the opening degree of the throttle valve is applied to the storage means storing the desired vehicle speed and varies the stored desired vehicle speed in accordance with the opening degree of the throttle valve. The actual vehicle speed signal is then brought into coincidence



with the desired vehicle speed, thus maintaining the vehicle at a constant speed equal to the desired vehicle speed.

3,752,253

FLEXIBLE SKIRTS FOR GAS-CUSHION SUPPORTED EQUIPMENT

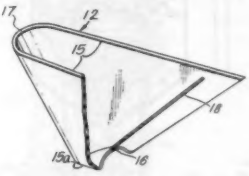
Leslie A. Hopkins, and Robert R. Henvest, both of Southampton, England, assignors to Air Cushion Equipment Limited, Southampton, Hampshire, England

Filed Apr. 22, 1971, Ser. No. 136,533

Claims priority, application Great Britain, Apr. 23, 1970, 19,535/70

Int. Cl. B60v *1/16*

U.S. Cl. 180—117 **10 Claims**



The invention relates to a flexible skirt for use on craft vehicles or devices which can be supported on a gas cushion, the skirt serving to prevent an escape of gas from the gas cushion to the atmosphere and comprising a plurality of juxtaposed segments which in use are downwardly extending and can seal against one another, each segment being U-shaped in transverse cross-section to form two side walls which gradually decrease in depth from their upper end towards their bottom end and the bottom edge or tip of each segment is disposed in a plane which is horizontal or at an angle to the horizontal less than the curved front edge of the segment.

3,752,254

AUTO BATTERY THEFT PREVENTING DEVICE

Joseph E. Carley, 51 Carmon Rd., Harrington Park, and Emil A. Steup, 27 Ardsleigh Dr., Madison, both of N.J.

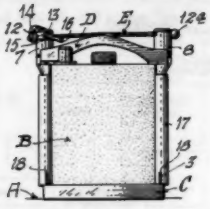
Filed Oct. 21, 1971, Ser. No. 191,509

Int. Cl. B60r *18/02*

U.S. Cl. 180—68.5 **6 Claims**

The lower ends of hold-down bolts at opposite sides of a storage battery are separably secured to anchoring structure in the engine compartment and their upper ends have elongated nuts screw-threaded thereon and tightly against the respective ends of a clamp bar that spans the top of the battery. A locking element has its ends respectively permanently

secured to one nut and locked to the other nut by a key or permutation operated lock and a guard tube is associated with each hold-down bolt, said clamp bar and said anchoring structure prevents unauthorized separation of the hold-down bolts from the anchoring structure, thereby to thwart attempted theft of the battery.



3,752,255
ULTRASONIC SCANNING APPARATUS

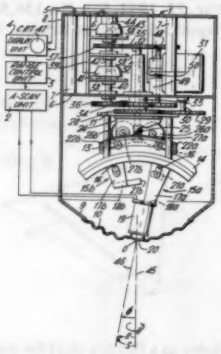
Christopher Rowland Hill, 29 The Warren, Surrey, Carshalton, and Victor Ralph McCready, 87 Grove Rd, Surrey, Sutton, both of England

Filed Apr. 4, 1972, Ser. No. 241,012

Claims priority, application Great Britain, Apr. 6, 1971, 8,847/71

Int. Cl. G01n *9/24*

U.S. Cl. 181—.5 NP **10 Claims**



A pulse-echo method of ultrasonic scanning to investigate the interior of a body involves contacting the body with an ultrasonic transducer at a fixed point having a first axis therethrough which is fixed relative to the body, projecting a pulsed ultrasonic beam through the fixed point along a second axis which is fixed relative to the transducer, and rotating the transducer about the first axis while progressively varying the angular inclination of the second axis to the first axis. The beam path then describes a spirally wrapped conical surface with its apex at the fixed point, which means that the transducer does not track across the body, but simply rolls on it at the fixed point, and this alleviates the transducer/body coupling problems which otherwise arise. Apparatus for this purposes comprises a support structure to define the first axis, a circular arcuate carriageway rotatable about this axis to produce the wrapping motion and to define by its centre of curvature the fixed point, a carriage extending transversely from the carriageway to define the second axis and movable along the carriageway to produce the progressive angular variation or spiral effect, and a transducer with its periphery at the fixed point, its beam path along the second axis, and rotatably mounted in the carriage to effect a rolling action on the body.

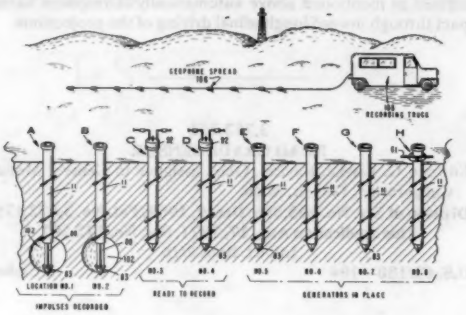
3,752,256
METHOD FOR GENERATING SEISMIC IMPULSES BELOW THE EARTH'S SURFACE

John C. Mollere, Houston, Tex., assignor to Western Geophysical Company of America, Houston, Tex.

Filed Dec. 14, 1970, Ser. No. 97,932

Int. Cl. B01v *1/02*; G01v *1/12*

U.S. Cl. 181—.5 XC **4 Claims**



This invention relates to a method and means for generating undersurface seismic impulses by positioning a combustion chamber at a desired point below the earth's surface, exploding in the chamber a first charge of an explosive gas, using the energy of the explosion to create a cavity in the soil around the combustion chamber, filling the combustion chamber and the cavity with at least a second charge of the explosive gas, and exploding the second charge both in the combustion chamber and in the cavity to produce a seismic impulse below the earth's surface.

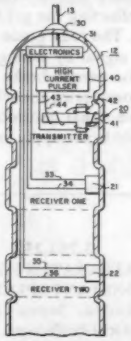
3,752,257
ACOUSTIC WELL LOGGING METHOD AND APPARATUS USING PIPE AS AN ACOUSTIC TRANSMITTER

Mike Davis, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 7, 1972, Ser. No. 232,377

Int. Cl. E21b *49/00*

U.S. Cl. 181—.5 AG **3 Claims**



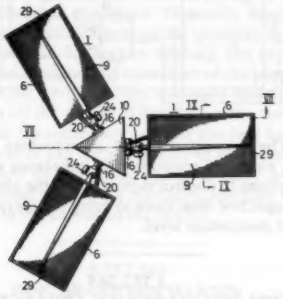
A well logging tool using high voltage pulses coupled into a coil surrounding a high permeability material is caused to traverse an earth borehole having a metal pipe therein. The magnetic field resulting from the voltage pulses passing through the coil distorts the pipe and causes the pipe to be an acoustic transmitter. The acoustic pulses are passed through the earth formation to one or more acoustic receivers within the well logging instrument. The tool is used to measure acoustic velocity within the formations and also to measure the quality of the cement bond between the pipe and the earth formations.

3,752,258

SPEAKER SYSTEM

Haruo Ishikawa, 12-35-314 Matsunoki, 1-chome, Suginami-ku, Tokyo, Japan

Filed Oct. 28, 1971, Ser. No. 193,453
Claims priority, application Japan, Nov. 4, 1970, 45/96444
Int. Cl. G10k *13/00*; H04r *1/28*
U.S. Cl. 181—31 B **11 Claims**



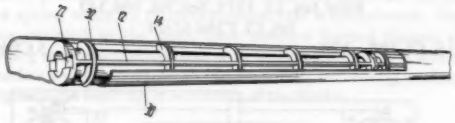
A speaker system provided with a plurality of radially arranged flat speaker-units, a speaker-unit support comprising support walls corresponding, respectively, to the speaker-units and sections capable of attaching onto structures, such as partitions, ceilings, etc., joint-units connecting the speaker-units with the support so that the speaker-units can be turned towards desired directions at various angles to the corresponding support walls either co-operatively or selectively, and means holding the speaker-units at a desirable position.

3,752,259

SOUND REDUCING DEVICE FOR USE WITH BAR FED MACHINERY

Donald James Wright, Stapleford, and James Boote, Burton Joyce, both of England, assignors to Wright Engineering Company (Nottingham) Limited, Nottingham, England

Filed Jan. 12, 1972, Ser. No. 217,373
Claims priority, application Great Britain, May 13, 1971, 14,736/71
Int. Cl. G10k *11/00*; B65g *11/16*; F16l *9/22*
U.S. Cl. 181—33 M **10 Claims**



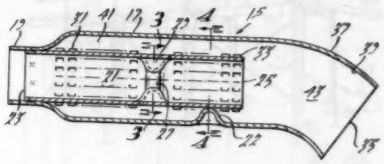
A device for reducing sound created by feeding of metallic bar material to a machine working the bar, the device comprising a substantially rigid tube of plastics material for positioning around the bar and within the bar carrier tube of said machine, in which said tube has a plurality of longitudinal ribs on its curved surface so that in use a plurality of chambers are formed between said plastics tube and the bar feed or carrier tube. In use the chambers may be left empty or filled with acoustic insulating material.

3,752,260

AIR RUSH SILENCER

Robert A. Heath, Jackson, Mich., assignor to Tenneco Inc., Racine, Wis.

Filed July 15, 1971, Ser. No. 162,959
Int. Cl. F01n *1/00*
U.S. Cl. 181—47 R **4 Claims**



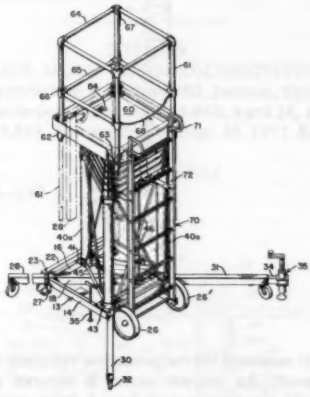
A silencer for the end of an internal combustion engine exhaust system comprises a perforated open end gas flow tube inside of an imperforate open end shell, the tube having restrictive means in it to force gas to flow through the perforations.

3,752,261

MULTI-STAGE LIFT

Sherman W. Bushnell, Jr., 1631 E. Olive Way, Seattle, Wash.

Continuation-in-part of Ser. No. 889,235, Oct. 30, 1969, abandoned. This application June 21, 1971, Ser. No. 155,076
Int. Cl. E04g *1/22*
U.S. Cl. 182—17 **24 Claims**



A multi-stage lift that is portable, compact, lightweight and easily handled like a hand truck, and yet is stable at relatively high extensions by virtue of a special outrigger system, three multi-stage telescopic cylinder units arranged and interconnected in a unique manner to operate in unison, and a working platform with a drop-down guard rail assembly.

3,752,262

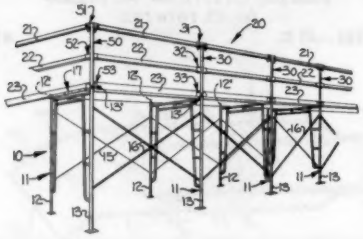
SCAFFOLD GUARD RAIL ASSEMBLY

Burl Helms, 9828 Mallard Creek Rd., Charlotte, N.C.

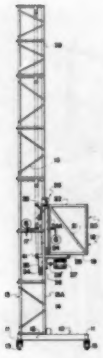
Filed June 1, 1972, Ser. No. 258,553
Int. Cl. E04g *5/00*
U.S. Cl. 182—113 **6 Claims**

A guard rail assembly mounted on a conventional scaffolding structure to be used primarily during the construction of a building to protect workers from falling from the scaffolding and to prevent construction materials from being kicked from the scaffolding. The guard rail assembly comprises a plurality of spaced tubular guard rail posts, having lower ends matingly

receiving reduced upper end portions of outer legs of the scaffolding structure and being carried thereby. A plurality of guard rail brackets are affixed to each guard rail post in vertical spaced relation, a plurality of horizontal guard rails being supportingly carried by said guard rail bracket and interconnecting the guard rail posts to provide a protective railing along the outer side edge of the platform.



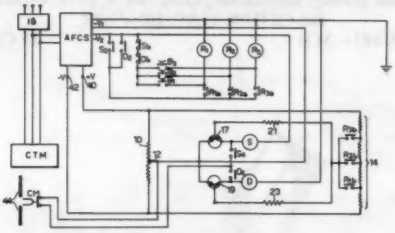
3,752,263
ELECTRIC TRAVELLING POWERED MAINTENANCE SCAFFOLD
Henry Thevenot, 589 Spence St., Winnipeg, Manitoba, Canada
Filed Jan. 10, 1972, Ser. No. 216,372
Int. Cl. E04g *1/18*
U.S. Cl. 182—148 **10 Claims**



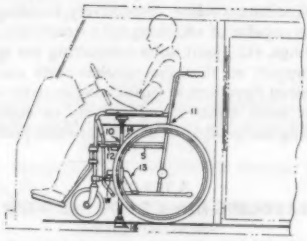
A cage is mounted for reciprocation vertically in a scaffold or framework. An electric motor is secured to the cage together with a reduction gear box. A drive sprocket and an idler sprocket are mounted on said cage, the drive sprocket being connected to the electric motor. A further idler is journalled at the top of the scaffold and a sprocket chain is anchored by one end thereof to the cage. It extends upwardly of the scaffold, over the idler at the top of the scaffold and then back down to the cage whereupon it engages around the idler on the cage and around the drive sprocket so that the other end of the chain loops freely and is supported on the cage for convenience. Rotation of the drive sprocket pulls the cage up and down the scaffold with friction and mechanical advantage remaining constant.

3,752,264
STOREY SELECTOR DEVICE FOR LIFTS
Romano Chiapella, Via Falletti 20, Biella, Italy
Filed Oct. 18, 1971, Ser. No. 190,159
Int. Cl. B66b *1/16*
U.S. Cl. 187—29 R **12 Claims**

A storey selector device for elevators and the like has a number of destination selector switches for different stopping levels which connect different tappings of a fixed resistance to one end of a sensing diagonal of a Wheatstone bridge, the other end of the sensing diagonal being connected to the slider of a potentiometer controlled by movement of the elevator carriage. The sensing diagonal incorporates unidirectional conductive elements responsive to imbalance currents in opposite directions to control movement of the elevator motor in opposite respective directions to bring the elevator carriage to the selected destination level.

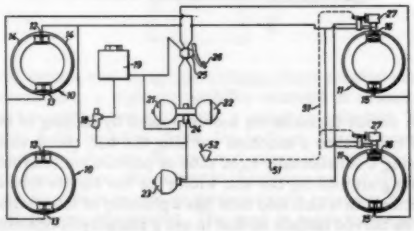


3,752,265
WHEEL CHAIR LOCKING ARRANGEMENT
Alfred W. Lyder, 3611 Ridge Rd., Lansing, Ill.
Filed Dec. 20, 1971, Ser. No. 209,977
Int. Cl. B60t *1/14*
U.S. Cl. 188—2 F **6 Claims**



A locking attachment for a wheel chair. The locking arrangement includes vertical shafts lowerable to a position for threading into a socket member fixed to a vehicle floor, thereby to maintain the wheel chair locked against movement.

3,752,266
FLUID PRESSURE BRAKING SYSTEMS
Leslie Cyril Chouings, Leamington Spa, England, assignor to Automotive Products Company Limited, Warwickshire, England
Filed Jan. 13, 1971, Ser. No. 106,147
Int. Cl. F16d *65/24*
U.S. Cl. 188—170 **5 Claims**



A vehicle braking system comprising internal shoe drum brakes of the two-leading shoe type for each wheel. Each front

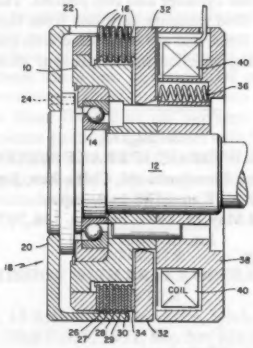
brake is operated by two wheel cylinders. Each rear brake is operated by a wheel cylinder at one end of the brake shoes and by a wedge-type mechanical expander at the other end. A first liquid accumulator is connected through a pedal operated valve to the wheel brake wheel cylinders and to one of the wheel cylinders of each front brake. A second liquid accumulator is connected through the pedal operated valve to the other front brake wheel cylinders and through a manually operable valve also to motor cylinders for the expanders. A third liquid accumulator is connected through the manually operable valve to said motor cylinders. The piston of each motor cylinder is urged in the brake applying direction by a spring acting through a plunger. Normally liquid pressure from the third accumulator acts on the plungers in opposition to the springs so that, for service braking, the expanders are operated by liquid supplied by operation of the pedal operated valve. For parking purposes, the manually operable valve is operated to cut off the supply of liquid from the third accumulator so that the expanders act to apply the rear brakes either due to the action of the spring, or due to the action of liquid pressure supplied by the pedal operated valve which liquid pressure is directed also by the manually operable valve to act on the plunger in opposition to the spring.

3,752,267

DISC BRAKE MECHANISM

Clark W. Dovell, Potomac, and Gerhard B. Winkler, Rockville, both of Md., assignors to the United States of America as represented by the Secretary of the Navy

Filed Dec. 7, 1971, Ser. No. 205,690
Int. Cl. B60t *13/04*
U.S. Cl. 188—171 **5 Claims**



A brake mechanism including a housing adapted to receive a rotating shaft, the housing having a plurality of annular discs fixed thereto. The shaft is coupled to a second plurality of discs alternately spaced with the first plurality. A pressure plate is provided to engage the disc assembly under the action of a spring when an electromagnetic coil is deactivated. The discs coupled to the shaft have notches formed therein of varying size which cooperate with fingers formed on a spider member so as to provide an incrementally increasing braking torque to the shaft upon actuation of the brake.

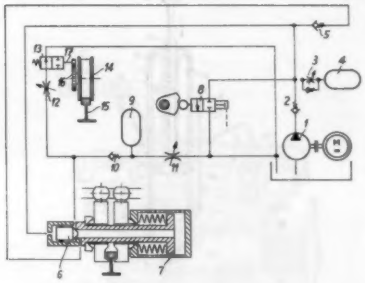
3,752,268

BRAKING SYSTEM

Hans Gfeller, Haldenstrasse 65, Langenthal, Switzerland

Filed May 12, 1971, Ser. No. 143,690
Claims priority, application Switzerland, May 12, 1970, 7005/70; Apr. 22, 1971, 5850/71
Int. Cl. B60t *8/14*
U.S. Cl. 188—181 A **7 Claims**

The braking system for the braking of a part which is moving relative to another part, of the type including a brake cylinder which is charged with a fluid under pressure when the brake is off, and which pressure is relieved for braking purposes, the system comprising a pressure accumulator connected with the brake cylinder through a nonreturn valve to receive part of the fluid escaping from the cylinder, the accumulator containing a gas under pressure, the pressure of which gas determines the value of the initial braking force, and a deceleration regulator connected to the brake cylinder through a throttle valve, the deceleration regulator including a casing, a cut-off valve, a flywheel rotated by a spindle



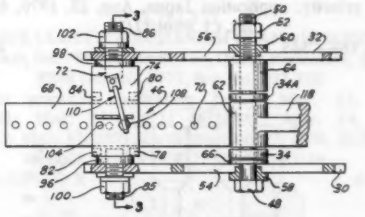
rotatably mounted in said casing and which is driven by an axle of the moving part so as to be capable of overruning with respect to the spindle to cause the cut-off valve to operate to stop the passage of fluid into the regulator when a predetermined deceleration value is reached, and spring means opposing overrunning of the flywheel, the force of which spring determines the deceleration rate.

3,752,269

QUICK SLACK ADJUSTER FOR LOCOMOTIVE BRAKES

Roy Henry Touchstone, P.O. Box 2003, Jackson, Tenn.

Continuation-in-part of Ser. No. 815,062, April 10, 1969, Pat. No. 3,613,840. This application Sept. 29, 1971, Ser. No. 184,798
Int. Cl. F16d *65/44*
U.S. Cl. 188—197 **5 Claims**

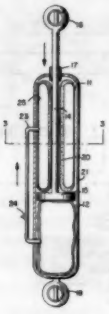


A brake adjustment device for locomotives wherein slack in the brake mechanism may be quickly and easily adjusted, and the brake shoes may be quickly removed and replaced when they have become sufficiently worn, or are otherwise damaged or in need of repair. The adjustment device includes an apertured slide bar connected with a brake lever and extending through a trunnion carried by the pull rods whereby the brake may be quickly adjusted by pulling the slide bar through the trunnion and securing the bar in the proper position by inserting a keeper pin through the slide bar and trunnion. Spring urged lever means is provided for retaining the keeper pin in position. In addition, the slide bar device facilitates release of the brake lever to provide for a quick clearance between the brake shoe and wheel, thus reducing the time required for the replacement of worn brake shoes.

3,752,270
SHOCK ABSORBER STRUCTURE INCLUDING FLEXIBLE BLADDER MEANS

Joseph M. Valdespino, 5023 Golf Club Parkway, Orlando, Fla.

Filed Dec. 29, 1971, Ser. No. 213,473
Int. Cl. F16f 9/18
U.S. Cl. 188—281 7 Claims

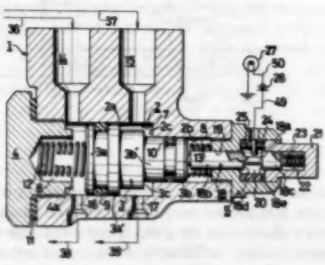


A vehicle shock absorber for dampening spring oscillations on a vehicle having a pair of bladders located in a casing and separated by a dividing member. The shock absorber may be attached between the body of a vehicle and its wheel suspension, whereby movement of the wheel suspension will move the dividing member between the bladders against one or the other bladder forcing a fluid in the bladders to flow therebetween through a bladder connecting member. A valve allows the fluid to flow easier in one direction than the other, or the valve may be eliminated by the choice of bladder material and design whereby a shock absorber is provided which may be of tubular design without having the usual fluid seals.

3,752,271
DUAL NETWORK HYDRAULIC BRAKE SYSTEM

Tetsuo Haraikawa, Funabashi-shi, Chiba-ken, Japan, assignor to Tokico Limited, Kawasaki-shi, Kanagawa-ken, Japan

Filed Aug. 23, 1971, Ser. No. 173,956
Claims priority, application Japan, Aug. 22, 1970, 45/73728
Int. Cl. B60t 11/20
U.S. Cl. 188—345 2 Claims

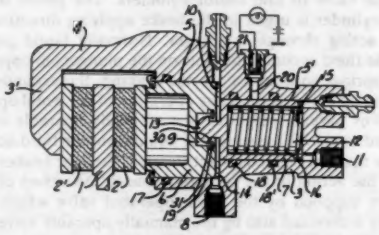


A hydraulic brake system for motor vehicles in which a master cylinder having two chambers is operably connected with a brake pedal. A plurality of wheel brake cylinders and a dual network hydraulic system connects the two chambers of the master cylinder with the wheel brake cylinders. A pressure regulator valve of a dual piston type is provided in the network and carries a movable contact for actuating an alarm device to indicate to the driver of an operational failure in the hydraulic system.

3,752,272
FLOATING TYPE DISC BRAKE

Toshio Ooka, Itami City, Hyoga Prefecture, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Dec. 21, 1970, Ser. No. 99,775
Claims priority, application Japan, Dec. 22, 1969, 44/103670; Apr. 8, 1970, 45/29866
Int. Cl. B60t 11/10
U.S. Cl. 188—345 7 Claims

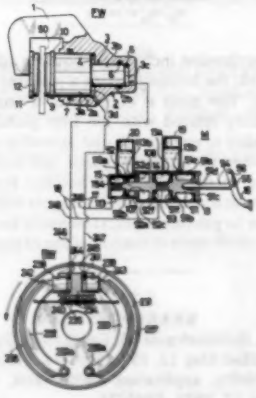


A floating type disc brake which is actuated by two separate braking pressure lines. This disc brake has friction pads which face each other with the two sides of the brake disc therebetween and a caliper which straddles over the said disc and which can float in the direction of the axis of revolution of the disc. On one side of this caliper with respect to the disc is provided a pressing mechanism which presses one of the friction pads against the friction surface of the disc. This pressing mechanism has one cylinder and two pistons. The two pistons are actuated by fluid pressure supplied from their respective braking pressure lines, and are connected with each other by a mechanical linking mechanism to prevent their separation from each other.

3,752,273
DUAL HYDRAULIC BRAKE SYSTEM

Tetsuo Haraikawa, Funabashi-shi, Chiba-ken, Japan, assignor to Tokico Limited, Kanagawa-ken, Japan

Filed May 25, 1971, Ser. No. 146,707
Int. Cl. B60t 11/20
U.S. Cl. 188—345 4 Claims



In a dual hydraulic brake system the front wheels are each provided with disc brakes or two leading shoe and drum type brakes and the rear wheels are each provided with leading-trailing shoe and drum type brakes. The higher pressure brake

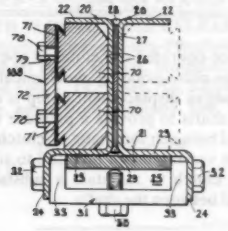
system is applied to the trailing shoe in the rear brake system and a portion of the front braking piston and the lower pressure brake system is applied to the leading shoe in the rear braking piston and another portion of the front braking piston. By selecting the piston areas and pressures the ratio of the braking force between the front and rear braking units can be maintained not only under normal conditions but even if one of the hydraulic systems is disabled.

3,752,274

ELECTRIC CURRENT COLLECTOR ARRANGEMENTS

George Robert Falkiner-Nuttall, Richmond, England, assignor to Trucked Hovercraft Limited, London, England

Filed Sept. 7, 1971, Ser. No. 178,203
Int. Cl. B60l *5/38*
U.S. Cl. 191—49 12 Claims



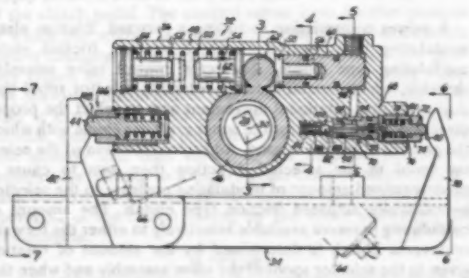
An electric current collector arrangement for co-operation with an electric conductor rail having three surfaces forming the inside surfaces of a generally channel-shaped concavity. The arrangement has a pair of conductive pick-up members which in operation are together biassed into contact with the centre of the three conductor rail surfaces and are biassed apart into separate guiding engagement with the other two rail surfaces. In the described embodiments the collector arrangements have opposed pairs of pick-up members carried by the arms of bifurcated yoke assemblies.

3,752,275

TRANSMISSION WITH BRAKE OPERATED DOWN SHIFTER

Otto Mueller, 13 Byfield Ln., Dearborn, Mich.

Filed Feb. 9, 1972, Ser. No. 224,680
Int. Cl. B60k *29/02*
U.S. Cl. 192—4 A 15 Claims



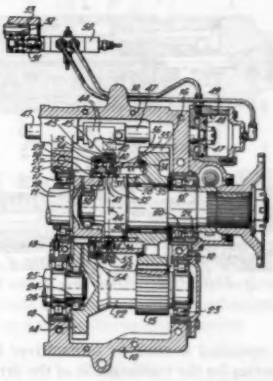
Apparatus for a motor vehicle that shifts the automatic transmission from a normal drive setting of the selector lever to a low speed setting to utilize the engine braking effort when the vehicle brakes are applied and shifts the automatic transmission back to its drive setting when the brakes are released.

3,752,276

SYNCHRONIZATION DEVICES

David John Hoyle, and Eric Albert Whateley, both of Huddersfield, Yorkshire, England, assignors to David Brown Gear Industries Limited, Huddersfield, England

Filed Dec. 3, 1971, Ser. No. 204,662
Claims priority, application Great Britain, Dec. 18, 1970, 60,360/70
Int. Cl. F16d *23/06*
U.S. Cl. 192—53 E 4 Claims



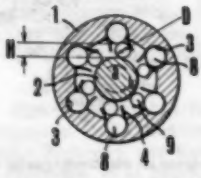
A synchronization device associated with a dog clutch for selectively connecting either of two rotating driving members to a rotatable driven shaft comprises a sleeve moveable axially upon the slidable toothed member of the dog clutch and having friction cones at its ends engageable alternatively with respective mating surfaces on the driving members, at least one longitudinally-extending slot of cranked shape forming inclined baulking surfaces in the sleeve, and a cylindrical pin passing through said slot and engaging at its radially inner end in a hole in said slidable toothed member and at its outer end in a hole in a ring slidable axially on the sleeve by a selector fork of a gear shift mechanism.

3,752,277

TORQUE CLUTCH MECHANISM IN AN AIR WRENCH

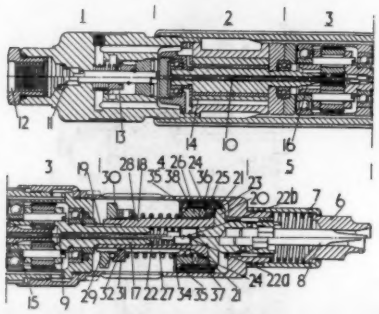
Sinji Nakai, No. 799 Kurotani, Yao, Osaka Prefecture, Japan

Filed Oct. 26, 1971, Ser. No. 192,228
Claims priority, application Japan, Mar. 13, 1971, 46/16741; Mar. 13, 1971, 46/16742; Mar. 13, 1971, 46/16743; Mar. 13, 1971, 46/16744; Oct. 27, 1970, 45/94951
Int. Cl. F16d *41/07*, *71/00*; E21c *5/16*
U.S. Cl. 192—56 R 4 Claims



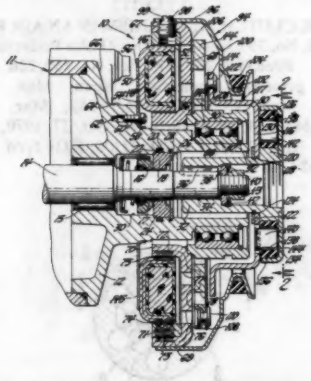
A torque clutch mechanism in an air wrench, comprising a torque clutch means capable of not only closing an air supply suspension valve by detecting an excess counterreactive force when such force is applied to the rotor shaft of said air wrench, but also reversing said rotor shaft.

3,752,278
IMPROVED POWER OPERATED WRENCH OR SCREWDRIVER
Ronald Frederick States, London, England, assignor to Desoutter Brothers Limited, London, England
Filed Feb. 22, 1971, Ser. No. 117,655
Claims priority, application Great Britain, Dec. 22, 1970, 60,815/70
Int. Cl. F16d 43/20
U.S. Cl. 192—56 R 2 Claims



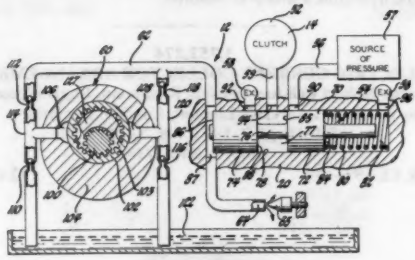
A power operated wrench or screwdriver having two dog clutches in series for the transmission of the drive in which one is a torque sensitive dog clutch having ramped interengaging driving surfaces adapted to be induced to become displaced against the action of a spring when the torque applied by the tool exceeds a predetermined value while the other one is a non-torque sensitive clutch which is adapted to become disengaged by displacement of the torque sensitive clutch.

3,752,279
ELECTROMAGNETIC CLUTCH
John R. Briar, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Mar. 20, 1972, Ser. No. 236,021
Int. Cl. F16d 27/10, 3/12
U.S. Cl. 192—84 C 5 Claims



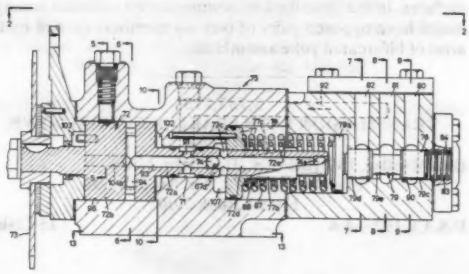
The drawings illustrate an electromagnetic clutch including torque dampener means having portions thereof compressed during operation between driving and driven elements, the driven element being secured through a hub member to an output shaft, and the driving element being engageable with an input rotor upon energization of a coil and mounted on the output shaft so as to be axially located thereon and yet rotatable thereon to the extent of any operational compression or expansion of the torque dampener means.

3,752,280
CONSTANT SPEED DIFFERENTIAL FLUID CLUTCH
Forrest R. Cheek, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Dec. 22, 1971, Ser. No. 210,682
Int. Cl. F16d 25/00
U.S. Cl. 192—85 AA 1 Claim



A fluid-pressure-operated slip clutch is operable to provide a slipping torque-pulse-isolating mechanical drive between two shafts. A positive displacement pump is operatively connected with the shafts to provide a pressure varying with the speed differential between the shafts. A clutch control valve is responsive to the varying pump pressure to supply fluid pressure to the slip clutch to maintain a substantially constant speed differential between the shafts.

3,752,281
REVERSING CLUTCHES WITH SELECTOR AND PRESSURE MODULATING VALVE
Bruce C. Arnold, Racine, Wis., assignor to Twin Disc Incorporated, Racine, Wis.
Filed May 10, 1972, Ser. No. 252,098
Int. Cl. F16d 25/10
U.S. Cl. 192—87.19 8 Claims



A power transmission including a forward, friction plate, modulating type friction clutch; a reverse, friction plate, modulating type clutch; a selector control valve assembly therefor, which assembly has a rotatable selector spool that during its first rotational movement acts to select the proper direction of the travel for the water craft or vehicle with which the present invention is used. Additional rotation of the selector spool in the selected direction then acts to cause a predetermined amount of modulating pressure to the selected hydraulically actuated friction type clutch. The amount of modulating pressure available selectively to either the forward or reverse clutch is determined by the amount of rotation given to the selector spool of the valve assembly and when this selected pressure has been reached, the valve assembly then reaches an equilibrium condition.

An improved valve assembly having a rotatable selector spool which during its initial rotational movement acts to select either a forward or reverse, hydraulically actuated, friction plate type clutch, and then during additional rotational movement of the valve acts to provide modulating pressure for

the selected clutch at the pressure determined by the rotational movement of the selector spool. After the desired amount of modulating pressure has been provided to the selected clutch, the valve assembly again reaches an equilibrium position where it is ready for the next command of the operator.

A water craft having a propeller shaft capable of being driven in either rotational direction, a source of power, and a transmission driven by said source of power, said transmission including a pair of hydraulically actuated, friction plate, modulating type clutches, one for reverse and one for forward direction of the craft, and a control valve assembly for said clutches and including a rotatable selector spool. During the initial rotational movement of the selector spool, one of the clutches is selected to drive the craft in either forward or reverse directions and then continued rotational movement of the spool causes the desired amount of modulating pressure to be available to the hydraulically actuated, modulating type friction plate clutch.

3,752,282

CLUTCH WITH PLURAL FLUID RELEASING MEANS

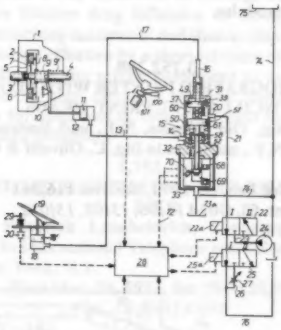
Helmut Espenshied, Ludwigsburg-Pflugfelden, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 1, 1972, Ser. No. 222,485

Claims priority, application Germany, Feb. 3, 1971, P 21 04 934.3

Int. Cl. F16d *25/08*

U.S. Cl. 192—91 R **10 Claims**



A clutch pedal is connected by a master cylinder and clutch cylinder through an operating valve with the clutch of a motor car so that the clutch can be disengaged and engaged by an operator before shifting the gear transmission. By operation of electromagnetic control valves, a source of pressure fluid can be connected with the operating valve to operate the same to supply pressure fluid to the clutch cylinder without operation of the clutch pedal. The control valves have another position in which the source of pressure fluid is disconnected while fluid is discharged through the control valves into a low pressure region by a spring-biased piston of the operating valve. The operating piston moves first rapidly, and then slowly while fluid is discharged from the operating cylinder through a throttle, and the clutch performs a corresponding movement first quickly and then slowly to the engaged position as required for shifting to a higher gear. Control means electrically control the electromagnetic control valve for automatic operation of the clutch during up and down shifting of the transmission.

3,752,283

POSITIVE LOCKING CLUTCH SHIFT MECHANISM

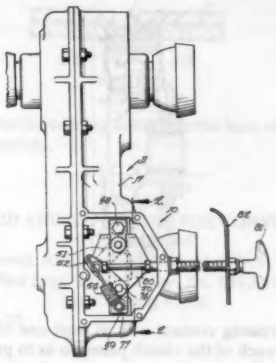
Allen J. Fisher, Fort Wayne, Ind., assignor to International Harvester Company, Chicago, Ill.

Filed Jan. 21, 1972, Ser. No. 219,804

Int. Cl. F16d *11/00*

U.S. Cl. 192—99 S **12 Claims**

An actuating mechanism for a positively engaging clutch including a pair of balanced clutch actuating cranks, a pair of interconnected crank levers connected to the cranks, and a unitary mounting and guide plate effective to cause the cranks to turn in unison when actuated by a suitable mechanical linkage. The clutch actuating cranks are so disposed when engaged as to present a moment arm of zero length to any axial force tending to cause clutch disengagement. A detent spring is also provided which acts on one of the lever arms and is effective to positively hold the actuating mechanism in either a totally engaged or a totally disengaged position.



3,752,284

ACCELERATION AND SPEED RESPONSIVE ELECTRONIC CLUTCH CONTROLS

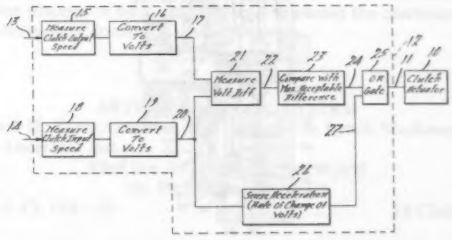
William J. Brittain, Westcliff-on-Sea, and David J. Price, Rayleigh, both of England, assignors to Ford Motor Company, Dearborn, Mich.

Filed Sept. 23, 1971, Ser. No. 183,192

Claims priority, application Great Britain, Feb. 23, 1971, 5,202/71

Int. Cl. F16d *43/284*; B60k *21/00*

U.S. Cl. 192—103 F **5 Claims**



A system for controlling the engagement and disengagement of a clutch for a motor vehicle. Voltages proportional to clutch input member acceleration and speed and to clutch output member speed are developed. Clutch actuator means coupled to electrical circuitry responds to these voltage signals to control clutch engagement and disengagement. Additional control circuitry may be provided.

3,752,285

CENTRIFUGAL CLUTCH

Akio Tanaka, Neyagawa, Osaka Prefecture; Heiji Fukutake, Toyonaka, Osaka Prefecture, and Kunihiko Ikeda, Neyagawa, Osaka Prefecture, all of Japan, assignors to Kabushiki Kaisha Daikin Seisakusho Kido-Motomiya, Neyagawa, Osaka Prefecture, Japan

Filed Aug. 19, 1971, Ser. No. 173,125

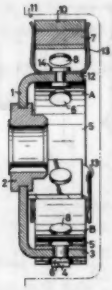
Claims priority, application Japan, Aug. 19, 1970, 45/83038

Int. Cl. F16d *7/00*

U.S. Cl. 192—105 CD **1 Claim**

In a centrifugal clutch including straps each made of an arcuate plate spring and having one end secured to a mounting

seat of a drive plate and the other end serving as a free end and clutch plates each fixed to the free end of each of the straps and having a clutch facing on the outer face thereof, damping springs being mounted on a suitable portion of the drive plate



in resilient pressing contact with at least one of the opposite side faces of each of the clutch plates so as to produce sliding friction to effect a damping action when the clutch plates are moved radially. The clutch further includes means to guide the clutch plates in the radial movement.

3,752,286

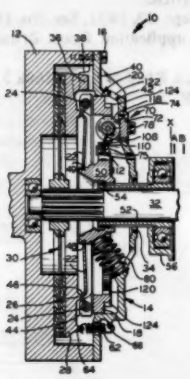
SELF-ADJUSTING CLUTCH

William Howard Sink, Auburn, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Feb. 24, 1972, Ser. No. 229,050

Int. Cl. F16d *13/75*

U.S. Cl. 192—111 A **5 Claims**



An automatic adjusting device for a spring loaded friction type clutch is incorporated, as a sub-assembly, in the lever system of the clutch between an actuating collar and an axially movable adjuster ring so as to be operable to advance the adjusting ring by very small increments as the friction surfaces of the clutch wear. The improvement being an adjusting device having support means secured to the clutch cover and coil springs concentrically disposed about a pair of hub members adapted to be coupled through a lost motion connection and rotatably carried on the support means. The coil spring associated with the first hub member is connected to the actuating collar and operable thereby to rotatably drive the hub members through the coupling connection. The coil spring associated with the second hub member engages the support means and reacts thereon to function as a backstop or drag brake when the first coil spring is not rotatably driving the first hub member. A worm gear integral with the second hub member engages and effects axial movement of the adjusting ring when the hub members are rotated past their lost motion connection by the first spring.

3,752,287

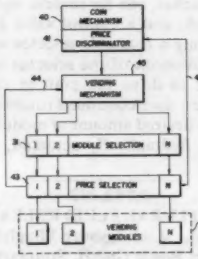
PRICE SELECTION VENDING MACHINE ARRANGEMENT

Troy Cullum, Conway, Ark., assignor to Polyvend, Inc., Conway, Ark.

Filed June 10, 1971, Ser. No. 151,792

Int. Cl. G07f *11/58*

U.S. Cl. 194—10 **8 Claims**



A vending machine electrical control system provides for setting a selected price in each of a plurality of modules by means of a simplified circuit using a common price selection relay arrangement for all modules and a price selection switch for each of the modules.

3,752,288

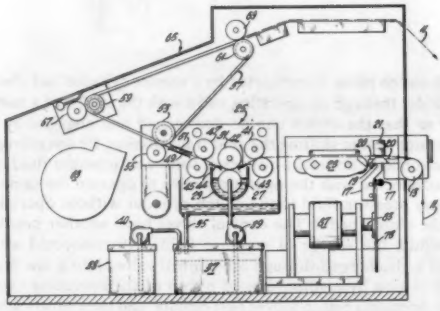
ELECTROGRAPHIC PRINTER WITH PLURAL OSCILLATING PRINT HEADS

Robert H. Detig, Old Tappan, N.J., and Bertrand Boyson, Manhasset, N.Y., assignors to Ing. C. Olivetti & Co., S.p.A., Ivrea, Italy

Filed Feb. 18, 1971, Ser. No. 116,361

Int. Cl. G01d *15/06*, *15/08*, *15/012*

U.S. Cl. 197—1 R **12 Claims**



A high speed, electrographic, non-impact printer for printing matrix-type characters on the dielectric coated face of a paper web. A print head having a plurality of linearly arranged styli therein is transported in an oscillatory fashion across the dielectric coated face of the web with the styli in virtual contact therewith. Means are provided for selectively energizing the styli for depositing dots of electric charge in image configuration on the dielectric as the print head traverses the web in both directions. The position of the print head as it traverses the web in both directions is sensed for controlling the selective energizing means for depositing dots of electric charge on the dielectric only when the print head is in predetermined positions in its path across the web. The dots of electrical charge are developed by means of a toner system.

3,752,289

TYPEWRITER ESCAPEMENT AND CONTROL DEVICES THEREFOR

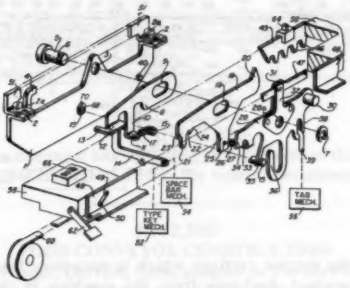
Manfred Link, Nuernberg, Germany, assignor to Triumph Werke Nuernber A.G., Nuernberg, Germany

Filed Sept. 30, 1970, Ser. No. 76,730

Claims priority, application Germany, Dec. 31, 1969, P 19 65 752.4

Int. Cl. B41j *19/00*

U.S. Cl. 197—82 12 Claims



In connection with an escapement which comprises a flying dog which for causing each escapement step of the carriage reaches out counter to the letter feed direction, there is provided a device which incidental to carriage return motion is operated by friction drag influence to block first said dog against outreaching movement and then to disengage said dog, the device being effective by a short advance movement of the carriage following the return movement to reapply the dog. The device is also operated by the tabulation control mechanism for durations of tabulating runs but not resultant to friction drag influence.

3,752,290

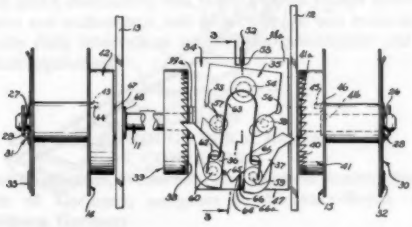
ADVANCED MECHANISM FOR INKED RIBBONS OR THE LIKE

Wolfgang Friedrich Langheinrich, Sherman Oaks, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 29, 1971, Ser. No. 128,963

Int. Cl. B41j *33/46*

U.S. Cl. 197—162 5 Claims



A mechanism for advancing and reversing an inked ribbon in a counter-printer or the like. A bistable device holds two pivoted pawls which selectively advance ratchet wheels. At each end of the ribbon, the bistable device changes position by a direct pull of the ribbon.

3,752,291

TYPEWRITER CORRECTION RIBBON AND PROCESS OF MANUFACTURE

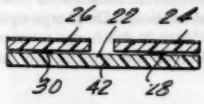
Victor Barouh, 935 Plum Tree Rd. West, Westbury, L. I., and Robert Glenn, 70-20 108th St., Forest Hills, both of N.Y.

Continuation-in-part of Ser. No. 875,939, Nov. 12, 1969, abandoned. This application Oct. 12, 1971, Ser. No. 187,947

Int. Cl. B41j *31/02*

U.S. Cl. 197—172 1 Claim

A typewriter ribbon comprising a base strip of a fluid impervious thin plastic material having spaced parallel coatings of adhesive thereon. A correction strip having a coating of a correction material and a transfer strip having a coating of solvent



carbon formula thereon are bonded to the base strip in spaced parallel relationship.

3,752,292

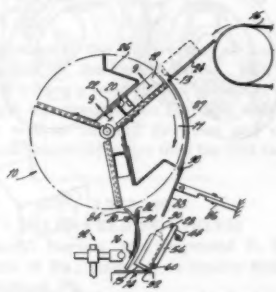
METHOD AND APPARATUS FOR CONVEYING CONTAINERS

Burton R. Garrett, 836 Logan St., Brooklyn, N.Y.

Filed Sept. 20, 1971, Ser. No. 181,815

Int. Cl. B65g *47/00*

U.S. Cl. 198—25 19 Claims



Method and apparatus for conveying containers on a conveyor in upright position is provided in which an open-ended movable receptacle is mounted adjacent to and above a conveying belt. The receptacle is adapted to stabilize a container after placement on a conveyor and to permit the continuous placement of containers on the conveyor.

3,752,293

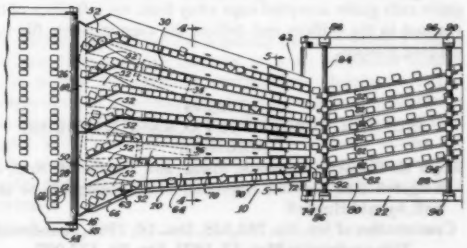
ARTICLE GROUPING SYSTEM

Paul H. Fort, Anderson, Ind., assignor to Lynch Machinery, Anderson, Ind.

Filed Dec. 17, 1970, Ser. No. 99,008

Int. Cl. B65g *47/24*, *47/26*

U.S. Cl. 198—30 19 Claims



An article grouping apparatus includes a downwardly inclined fanshaped platform adapted to columnate and transport a plurality of articles. The apparatus includes a first conveyor adapted to receive, space apart and further columnate articles from the vibrating platform and a second conveyor adapted to receive articles from the first conveyor and to transport the articles in columns for inspection and processing.

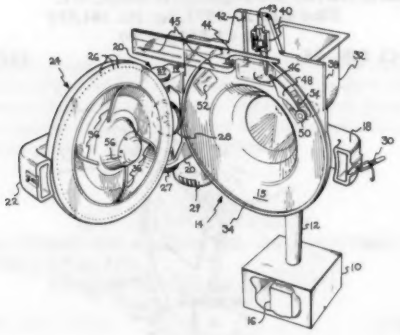
The fan-shaped platform includes a plurality of troughs adapted to accommodate the articles and inclined surfaces flanking the troughs adapted to urge the articles into the troughs. Wire members connected to the inclined surface align the non-aligned articles. Discharge openings are defined on the inclined surfaces to discharge articles traveling on the inclined surfaces before the articles are deposited onto the first conveyor.

3,752,294

CAP SORTING APPARATUS

Shepard Lewis Harmon, Toledo, Ohio, assignor to Owens-Illinois Inc., Toledo, Ohio

Filed June 8, 1972, Ser. No. 260,818
Int. Cl. B65g 47/24
U.S. Cl. 198—33 AA **13 Claims**



An improved wheel-type sorter for magnetic and nonmagnetic skirted closure caps. A hollow cap transfer disk is rotated by a rim drive system. The transfer disk is mounted in facing relationship with an annular, bell-shaped support member. A series of orifices in the periphery of the face of the transfer disk facing the support member are connected to a source of vacuum. Caps to be sorted are fed through the support member and are adhered on the transfer disk, in substantially single file, near the bottom of the transfer disk's path of travel by the effect of the vacuum present at the orifices. The caps so adhered are rotated upwardly as the disk moves to a sorting zone. A guide member just prior to the sorting zone positions caps for accurate discrimination in the sorting zone. A rotating wheel in advance of the guide member deflects slightly misaligned caps into contact with the guide member. In the sorting zone, a discriminating finger accepts caps which have their interior facing the transfer disk and rejects caps having their interior facing away from the disk. Finally, outlet guide rails guide accepted caps away from the influence of the vacuum in the orifices and deliver the caps in single file to a capping process.

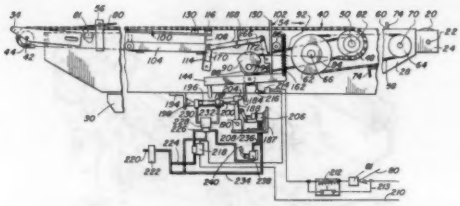
3,752,295

INDEXING FEEDER FOR PACKAGE HANDLING MACHINE

Roger K. Hubbell, Plymouth, Mass., and Eugene M. Noel, 42 Kingston Rd., Newton Highland, Mass., assignors to said Noll, by said Hubbell

Continuation of Ser. No. 782,525, Dec. 10, 1968, abandoned.
This application Mar. 12, 1971, Ser. No. 123,907
Int. Cl. B65g 47/29
U.S. Cl. 198—34 **7 Claims**

The disclosure describes a package handling device including escapement mechanism to transform incoming random or intermittent product feed into uniformly timed and spaced discharge. In one embodiment, the device includes switch means on the inlet conveyor to detect product input to the machine and an escapement mechanism comprising a barrier carriage adapted to be raised to prevent passage of product and a release means adapted to be lowered from the path of product to time its release from the escapement, latch means to hold the barrier carriage in raised position in response to the switch means to allow the build-up of product on the inlet conveyor and means to delay the disengaging of the latch means sufficient to allow a predetermined product build-up



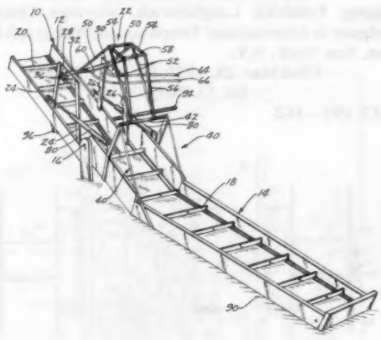
behind the barrier carriage which is necessary for uninterrupted product discharge from the machine in timed and spaced relationship according to the infeed requirement of the subsequent processing machine. Other embodiments are disclosed.

3,752,296

HYDRAULICALLY OPERATED ELEVATOR FEEDER

Virgil V. Peterson, Paton, Iowa, assignor to Dean W. Mitchell, Des Moines and James B. Smith, Perry, Iowa, part interest to each

Filed Dec. 27, 1971, Ser. No. 211,969
Int. Cl. B65g 37/00
U.S. Cl. 198—94 **7 Claims**



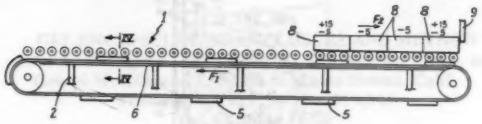
A baled hay and grain elevator having a feeder section hydraulically powered by a double acting hydraulic power cylinder to pivotally move and hold the feeder section at any desired position. The double acting power cylinder is positioned between upstanding frame side members on the elevator and feeder sections which are pivotally interconnected by connecting members extending inwardly and upwardly. Hydraulic cylinder is operatively connected to the upstanding frame on the elevator section and intermediate the ends of the connecting member associated with the other upstanding frame member. A telescoping guide member extends between the elevator section and the feeder section. The conveying means on the elevator section and feed section is powered by a power take-off on a tractor which also includes a hydraulic system for operating the double acting cylinder.

3,752,297

ROLLER CONVEYOR HAVING AN ENDLESS DRIVING ARRANGEMENT

Pierre Francois Lemaresquier, 9, avenue de L'Observatorie, Paris (5'eme), France

Filed Dec. 11, 1970, Ser. No. 97,155
Claims priority, application France, Dec. 17, 1969, 6943689
Int. Cl. B65g *13/02*
U.S. Cl. 198—127 R **1 Claim**



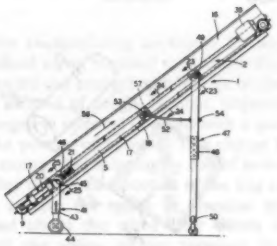
A roller conveyor having a drive arrangement of the endless type which is capable of driving the rollers intermittently.

3,752,298

FOOD CONVEYOR CONSTRUCTION

Carl D. Wenger, Orrville, Ohio, assignor to The Biro Manufacturing Company, Marblehead, Ottawa, Ohio

Filed Dec. 16, 1971, Ser. No. 208,757
Int. Cl. B65g *15/60*
U.S. Cl. 198—204 **7 Claims**



A conveyor having an endless belt for conveying food products such as meat products between meat processing units such as grinders and mixers, which may be cleaned readily with quick dismantling and reassembly of trough sections, pan unit and endless belt, and with complete belt removal, at normally daily intervals as required by government and inspection regulations.

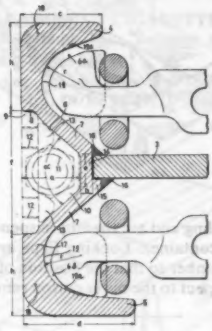
3,752,299

CONVEYOR TROUGH FOR SCRAPER-CHAIN CONVEYORS

Gunter Blumenthal, Westerholt, and Reinhold Krohm, Herne, both of Germany, assignors to Klockner-Werke AG, Duisburg, Germany

Filed Mar. 6, 1972, Ser. No. 231,914
Claims priority, application Germany, Mar. 12, 1971, G 71 09 416.1
Int. Cl. B65g *15/60*
U.S. Cl. 198—204 **4 Claims**

The trough has transversely spaced mirror-symmetrical sidewalls of substantially sigma-shaped cross-section connected by a transverse wall extending between them substantially midway of their height. The sidewalls each have an outer side provided with a longitudinally extending first groove of substantially trapezoidal cross-section and having a transverse depth smaller than the height of its open side, with the latter height being greater than one third of the height of the respective side wall. Each sidewall each has an inner side provided with a pair of inwardly open longitudinally extending grooves which are located above and below the transverse wall, respectively, and which are each bounded in part by one side wall portion extending from an upper or lower ridge towards the transverse wall and having an inwardly directed semi-circularly curved face of a large first radius, and in part by an inwardly inclined second side wall portion extending from the



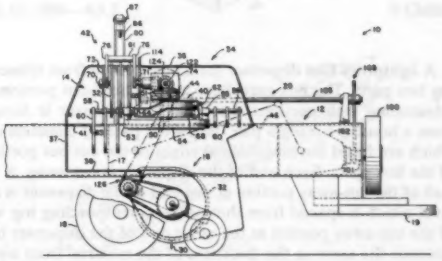
first sidewall portion to the transverse wall and in addition bounding one side of the outer groove, with the second sidewall portion having a wing-shaped curvature over at least part of its length intermediate the first side wall portion and the transverse wall in outward direction and on a second radius which is substantially larger than the first radius.

3,752,300

BALER FEEDING SYSTEM

Harry G. Eberly, Narvon, and Raymond E. Fisher, New Holland, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Division of Ser. No. 664,685, Aug. 31, 1967, Pat. No. 3,570,395. This application Dec. 23, 1970, Ser. No. 100,978
Int. Cl. B65g *29/00*
U.S. Cl. 198—212 **1 Claim**



A feeding mechanism for a pickup baler in which a rotary feed unit delivers crop material to a set of packer fingers which convey the material into the bale chamber between plunger strokes. The rotary feed unit is mounted for operation about a generally vertical axis and comprises two sets of feed fingers which successively sweep crop material across the feeder platform and into the path of the packer fingers. Tee angular position of the feed fingers is controlled by a circular cam track.

3,752,301

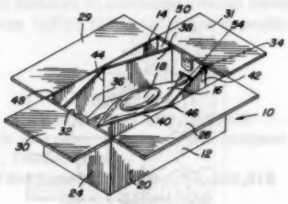
SHOCK-PROOF PACKING CONTAINER

Oscar Bluemel, 4530 N. Albany Ave., Chicago, Ill.

Filed Feb. 22, 1971, Ser. No. 117,468
Int. Cl. B65d *85/30*
U.S. Cl. 206—46 FR **10 Claims**

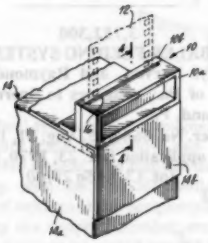
A shock-proof packing container for shipping fragile articles comprises a rectangular outer carton, a polygonal inner

support member that is adapted to fit snugly within the outer carton and bear against all four side walls of the outer carton, and a flexible sling attached to opposing walls of the inner support member and extending therebetween. Fragile articles are



wrapped in this sling and are thereby suspended in the interior of the packing container. Locking flaps are attached to the inner support member so that the position of the inner support member with respect to the outer carton remains fixed.

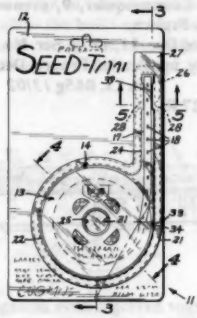
3,752,302
FILM DISPENSER
Nick G. Branibar, Sparta, N.J., assignor to Anken Industries, Morristown, N.J.
Filed June 1, 1971, Ser. No. 148,623
Int. Cl. B65d *85/67*
U.S. Cl. 206—52 F **4 Claims**



A lightproof film dispenser for a box formed from telescoping box parts. The box parts have adjacent cut-out portions in telescoping wall portions thereof. The dispenser is formed from a housing having a pair of spaced, parallel channels into which are fitted the longitudinal edges of the cut-out portions of the box parts. Each end of the dispenser is cut-away. A top wall of the cut-away portion at one end of the dispenser is at a level which is spaced from that of the corresponding top wall of the cut-away portion at the other end of the dispenser by a distance the same as the thickness of the material from which the box parts are made. This difference in levels of the top walls provides for a light-tight seal.

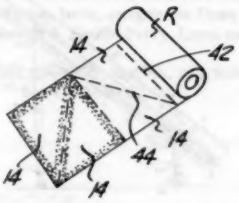
3,752,303
SEED TAPE DISPENSER
Russell G. Foster, Mankato, Minn., assignor to Northrup, King & Co., Minneapolis, Minn.
Filed Apr. 5, 1972, Ser. No. 241,217
Int. Cl. B65d *75/40, 85/67*
U.S. Cl. 206—52 R **9 Claims**

A dispensing package for a roll of seed tape consisting of a plasticized cardboard backing to which a transparent cover member is hermetically sealed to define a reel cavity. A reel for the seed tape is rotatably carried in the cavity, which includes a tangential outlet through which the tape can be dispensed. The reel consists of a flat circular cardboard member, having suitable printed indicia on one face for viewing through the transparent cover, and a plastic spool which cooperates with the cardboard member to carry the tape. Means are provided for locking the reel in a predetermined position to preclude its rotation due to hygroscopic expansion



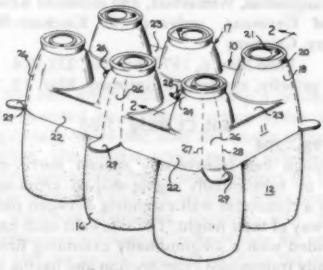
and contraction of the tape, and to thereby maintain the printed indicia in an upright position.

3,752,304
MASKING DEVICES
Philip M. Alef, 160 St. Clair River Dr., Algonac, Mich.
Filed Sept. 7, 1971, Ser. No. 178,322
Int. Cl. B65d *85/00*
U.S. Cl. 206—58 **1 Claim**



Masking device for use in painting at peripheries of rectangular surfaces comprising two triangular masks of sheet material.

3,752,305
PLASTIC CARRIER FOR CONTAINERS
Clarence A. Heyne, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed May 10, 1971, Ser. No. 141,491
Int. Cl. B65d *71/00, 85/62*
U.S. Cl. 206—65 E **5 Claims**



The invention disclosed relates to a multi-pak plastic jacket-type container carrier. The carrier is thermoformed from thermoplastic sheet or web stock and provides individual compartments or cavities in annular substantially sleeve form. The

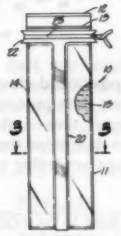
upper annular margin of the compartment wall includes a radially inwardly directed lip or rim that permits container movement into the carrier and engages a bead or edge at the upper end of the container upon reverse movement, thereby retaining the container in suspended support for transport. The carrier has a tear strip means at each cavity for removal of the container and includes finger carrying means for transport.

3,752,306

GEL ENCAPSULATING ENCLOSURE AND METHOD

John T. Thompson, 244 Loring St., Los Angeles, Calif., and George W. Gillemot, 233 20th St., Santa Monica, Calif.

Filed July 6, 1971, Ser. No. 159,715
Int. Cl. B65d *79/00*
U.S. Cl. 206—47 A **20 Claims**



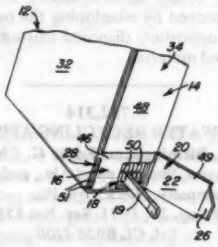
A protective encapsulating enclosure for and method of protecting spliced wires, terminal strip assemblies and the like from the elements and contact with foreign bodies. The enclosure may be formed of tough, flexible, impervious material and is precharged in selected portions with a quantity of non-setting gel-like potting compound. This charge is retained in place during storage and shipping by one of several simple expedients so that the gel-free portion of the bag can be readily expanded to receive the splice or terminal strip and then secured closed about the wires after which the walls are kneaded until the splice and/or terminal strip has been completely immersed in the compound.

3,752,307

COMBINATION CIGARETTE AND MATCH HOLDER

Ronald L. German, 5131 Blairwood Dr., La Palma, Calif.

Filed Dec. 23, 1971, Ser. No. 211,451
Int. Cl. B65d *79/00*
U.S. Cl. 206—48 **13 Claims**



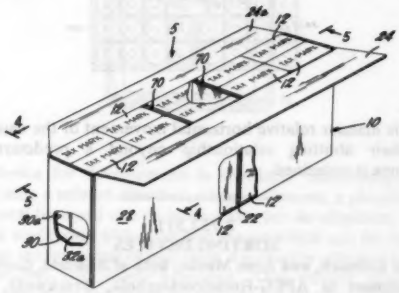
A combination cigarette and match holder having a housing provided with a cigarette holding portion, and a match holding portion provided with an opening in the housing for passing matches therethrough and a hinged flap for selectively covering and uncovering the opening. The opening is arranged in a side wall of the housing adjacent an end wall thereof and the front wall, while being spaced from the rear wall so as to form a restricted opening. A tab on the flap cooperates with a slot in the housing for retaining the flap in a position covering the opening. An insert element is arranged within the housing and provided with a wall separating and partially defining the cigarette and match holding portions. This insert may be constructed from a flat piece of material as a longitudinally extending member folded along four transverse and two longitudinal fold lines.

3,752,308

PACKAGING OF CIGARETTES

Carl J. Begemann, Miami, Fla., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Aug. 28, 1972, Ser. No. 284,126
Int. Cl. B65d *85/10*
U.S. Cl. 206—48.5 **7 Claims**



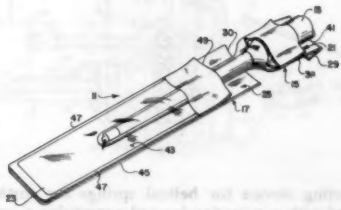
Packaging is provided in which smaller than standard-size cigarette packages are packed in a carton designed to permit the cigarette packages to be marked in a tax marking machine for marking standard-size cigarette packages.

3,752,309

SHEATH PACKAGE WITH SHEATH REMOVAL SIGNALLING FOR CLINICAL TEMPERATURE MEASUREMENT INSTRUMENT

Gene Hopkins, Tulsa, Okla., and Raymond F. Mohrman, St. Louis, Mo., assignors to LaBarge, Inc., St. Louis, Mo.

Filed Nov. 3, 1971, Ser. No. 195,242
Int. Cl. A61b *19/02*; **B65d** *85/00*
U.S. Cl. 206—63.2 **9 Claims**



A sheath package for use with a clinical temperature measurement probe. An elongate sheath has a mouth at one end for receiving the probe and is normally enclosed by a cover, the sheath extending into a mouth at one end of the cover such that the probe may be inserted in the sheath while the latter is in the cover and then withdrawn with the sheath thereon. A signal means has a normally concealed position when the sheath is in the cover before being with drawn and is moved to a position in which it is visible when the probe with the sheath thereon is reinserted in the cover.

3,752,310

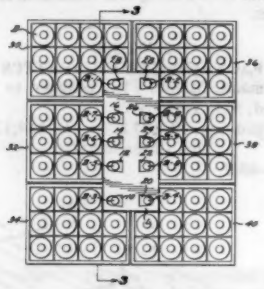
LOCK FOR BOTTLE-CONTAINING CASES

Will L. Higgin, 23 Heritage Ln., Newport Beach, Calif.

Filed Apr. 3, 1972, Ser. No. 240,546
Int. Cl. B65d *71/00*; **B65g** *1/14*
U.S. Cl. 206—65 E **10 Claims**

An arrangement for temporarily locking together the upper layer of a multi-layered stack of beverage bottle-containing

cases. A sheet formed with a plurality of apertures is dropped over the bottles of the upper layer of cases, with the apertures being received by at least one bottle in each case of the layer.



In this manner relative horizontal movement of the cases out of their abutting relationship beyond a predetermined distance is restrained.

3,752,311

SORTING DEVICES

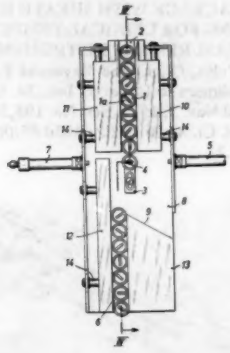
Klaus Kobusch, and Arno Manke, both of Bielefeld, Germany, assignors to APEG-Hochdrucktechnik, Brackwede, Germany

Filed Mar. 22, 1972, Ser. No. 236,930

Claims priority, application Germany, Mar. 24, 1971, P 21 14 125.3; Feb. 17, 1972, P 22 07 346.7

Int. Cl. B65g *47/24*; B07c *1/20*

U.S. Cl. 209—72 **23 Claims**



A sorting device for helical springs for sorting springs equipped with a mounting leg and comprising a conveyor for the springs, a feed duct arranged to receive springs from the conveyor, a supporting element mounted in the feed duct, for supporting springs thereon, a sensor piston operated by a pressure source and arranged to engage with a spring resting on the supporting element whereby the piston moves to different positions depending on whether the mounting leg of the spring is in the correct or incorrect position, means for transferring a spring having its mounting leg in the correct position to a station for further processing and means for ejecting a spring having its mounting leg in the incorrect position.

3,752,312

LABEL, METHOD AND SYSTEM FOR BAGGAGE HANDLING

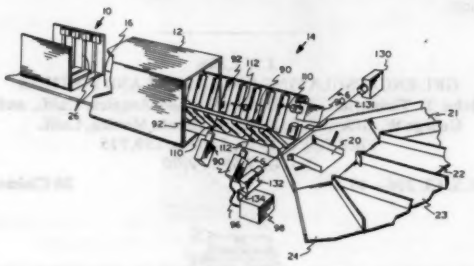
Louis Soltanoff, 127 Four Brooks Rd., Stamford, Conn.

Filed Feb. 16, 1971, Ser. No. 115,662

Int. Cl. B07c *5/342*

U.S. Cl. 209—111.7 **34 Claims**

This is a baggage-handling system in which luggage of any size or shape is wrapped with an encircling belt made of a heat-shrinkable plastic material at a baggage-tagging station designed for this purpose. The baggage is then put on a conveyor which carries it through an oven to shrink the plastic so that the tag is securely attached to the luggage, and the belt lies flat against the surface of the luggage. Destination-identifying indicia printed on the plastic belt are then read by an optical scanner which is positioned alongside the baggage conveyor. Suitable electronic data processing equipment responsive to the optical scanner then controls additional baggage conveying equipment to determine the destination of each individual piece of baggage according to the indicia read from the plastic belt.



3,752,313

FLOTATION APPARATUS

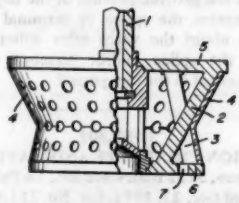
Jean Benito Watin, Paris, France, assignor to Societe Miniere Et Metallurgique De Penarroya, Paris, France

Filed Feb. 15, 1972, Ser. No. 226,625

Claims priority, application France, Feb. 19, 1971, 7105710

Int. Cl. B01f *3/04*

U.S. Cl. 209—169 **3 Claims**



The efficiency of the agitator shown in French Pat. No. 1,200,365 is improved by enveloping the outer bars defining two coaxial and oppositely disposed frustums of cones with a sheet of perforated material.

3,752,314

FLUME WATER RECYCLING APPARATUS

James A. Brown, Birmingham; Eddie G. Chieves, Leeds, and Wesley D. Runyan, Pinson, all of Ala., assignors to The Rust Engineering Company, Pittsubrgh, Pa.

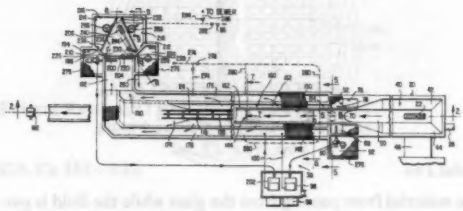
Filed Aug. 27, 1971, Ser. No. 175,516

Int. Cl. B03d *1/00*

U.S. Cl. 209—173 **12 Claims**

Flume water recycling apparatus operates in conjunction with a flume and a jackladder of a log handling system. Flume water with logs, loose bark, grit and sand flows down the flume toward the jackladder. The sand and some grit pass through a sand outlet into a collection pit beneath the end of the flume, whereas the logs, water, remaining grit and bark flow over a bridge toward the jackladder. Logs and large pieces of bark are removed from the water by a series of flights of the jackladder. Water, grit and small pieces of bark flow through tapered apertures provided in a tail section of the jackladder and into a grit settling trough. Slow water velocity in the

trough promotes settling of the grit to the bottom of the trough. The return run of the flights extends along the bottom and scrapes the grit into the collection pit. The flights then extend around a tail pulley for advancement into a flight guide tunnel formed by the bridge and the tail section to prevent

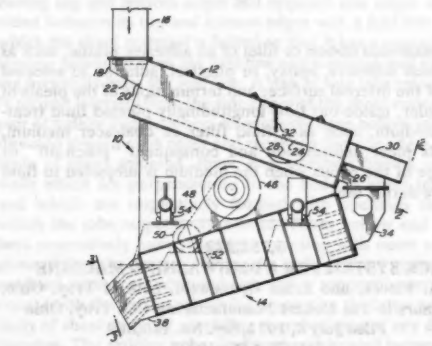


jamming of the flights. Bark and relatively clear water flow from the trough into side channels that extend to a second grit settling trough. Water and bark from the second trough flow into a bark basin where the bark is separated from the water and the water is returned to the flume.

3,752,315
COMBINATION SCALPER CLEANER

Louis E. Hubach, Aurora, Ohio, assignor to W. S. Tyler, Incorporated, Cleveland, Ohio

Continuation-in-part of Ser. Nos. 795,260, Jan. 30, 1969, Pat. No. 3,680,697, and Ser. No. 130,311, April 1, 1971, Pat. No. 3,688,902. This application July 26, 1971, Ser. No. 165,929
Int. Cl. B07b *1/36*
U.S. Cl. 209—240 7 Claims

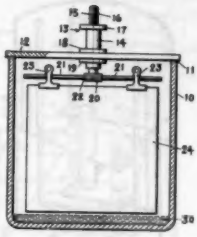


Grain cleaning apparatus providing a flow path for grain including, in sequence, a scalper and a cleaner. First ducting means is connected to a hopper on the inlet side of the scalper and a second ducting means is connected to the outlet portion of the scalper to conduct grain from the scalper to the grain cleaner. The scalping unit separates grain from impurities which are larger than the grain. The grain cleaning unit separates grain from impurities smaller than said grain. The scalping unit and the grain cleaning unit are rigidly connected together to operate as a unit in vibratory motion to shake the grain on industrial screens in both units. The inlet hopper and the outlet of the grain cleaning unit are in vertical alignment to allow the insertion of the grain cleaning apparatus into an existing vertical ducting arrangement without need for extensive revision or restructuring of an existing building or ducting network.

3,752,316
DEVICE FOR DEVELOPMENT IN THIN-LAYER CHROMATOGRAPHY

Ryuzo Takeshita, No. 5-4-11, Koenzi Minami, Tokyo, Japan

Filed June 25, 1971, Ser. No. 156,766
Int. Cl. B01d *15/08*
U.S. Cl. 210—198 5 Claims

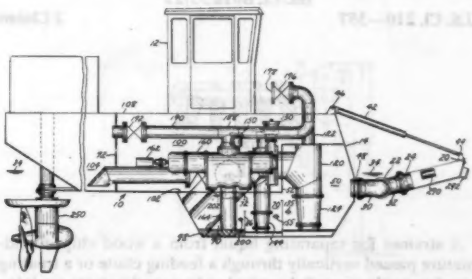


A device for development in thin-layer chromatography comprising a solvent chamber, a support means, a plurality of horizontal bars and one or more plates for development. The plate is suspended with a support means which can be rise or fall, and the lower end of said plate is soaked in solvent when it has become completely saturated. This solvent chamber brings about a good result on the reproducible quality of R_f values in thin-layer chromatography.

3,752,317
OIL RECOVERY VESSEL

Eric E. Lithen, Garden City, N.Y., assignor to Oil Recovery Systems, Inc., Mineola, N.Y.

Filed Nov. 10, 1971, Ser. No. 197,248
Int. Cl. E02b *15/04*
U.S. Cl. 210—242 3 Claims



A vessel for collection and salvage of oil spills having a vertically adjustable forward-mounted scoop from which fluid collected under the action of gravity and the forward motion of the vessel is directed through conduits into submerged separation tanks under conditions of laminar flow. In the submerged tanks, the fluid is separated into oil, which is transferred to storage tanks, and water which is discharged.

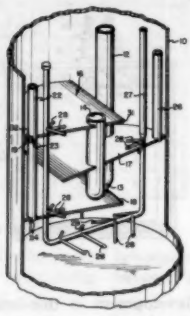
3,752,318
LIQUID SEPARATION APPARATUS

Ray J. DeRouen, New Iberia, La.; Ray Tuggle, and Richard H. Graves, both of Bellaire, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 6, 1971, Ser. No. 205,141
Int. Cl. C02c *1/26*
U.S. Cl. 210—251 5 Claims

The invention relates to an apparatus for effecting the separation of a multi-phase liquid mixture comprising water, and a hydrocarbon or similar material characterized by a

specific gravity not exceeding the specific gravity of water. The apparatus comprises an elongated casing into which the said liquid mixture is introduced. The latter is then caused to pass through a labyrinthine passage formed of continuous, though discrete passage segments in a general vertical



direction. In the course of traversing said passage, the water will gravitate toward the lower end of the casing, and be discharged. The non-aqueous liquid phase segment will rise outwardly and upwardly within the discrete segments of said passage, whereby to be readily withdrawn from the apparatus.

3,752,319

STRAINER DEVICE IN A CONTINUOUS CELLULOSE DIGESTING PLANT

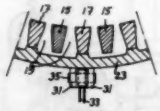
Ole J. Richter, Karlstad, Sweden, assignor to Kamyr Aktiebolag, Karlstad, Sweden

Filed Sept. 20, 1971, Ser. No. 181,773

Claims priority, application Sweden, Sept. 24, 1970, 12997/70

Int. Cl. B01d *33/22*

U.S. Cl. 210—357 **2 Claims**



A strainer for separating liquid from a wood chips-liquid-mixture passed vertically through a feeding chute or a treating vessel comprises parallel vertical rods spaced to form straining slots. Every second strainer rod is stationary and the intermediate strainer rods which are pivoted at their upper ends, are united to form a unit that is moveable back and forth by means of a reciprocating drive means in order to prevent clogging of the strainer.

3,752,320

ICE GUARD FOR DRINKING GLASSES

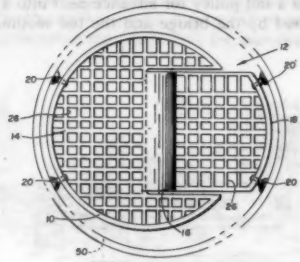
F. Joseph Biro, 209 Comly Rd., Apt. K-12, Lincoln Park, N.J.

Filed June 27, 1972, Ser. No. 266,657

Int. Cl. B01d *35/28*

U.S. Cl. 210—469 **8 Claims**

This invention pertains to an ice guard particularly adapted to be placed within a drinking glass to hold solid or semisolid material within the glass while the glass is tilted for drinking from said glass. The guard is preferably a plastic unit molded so as to incorporate and provide an integral tongue member connected to the guard body by a U-shaped portion. This U-shaped portion acts as a spring and moves the tongue into engagement with and retains the tongue in engagement with the interior of the glass. The installed guard is perforated and provides a screen which prevents the larger particles of ice and



like material from passing from the glass while the fluid is permitted to pass by and around the screen and from the glass.

3,752,321

PLEAT DEFORMATION CONTROL FOR PLEATED FLUID TREATMENT MEDIA

James C. McLaren, Racine, Wis., assignor to Tenneco Inc., Racine, Wis.

Filed June 3, 1971, Ser. No. 149,508

Int. Cl. B01d *27/06*

U.S. Cl. 210—493 **6 Claims**

A continuous ribbon or fillet of an adhesive plastic, such as a hot melt adhesive, epoxy, or plastisol, adhered to selected areas of the internal surfaces and terminations of the pleats of an annular, inside-out flow longitudinally pleated fluid treatment medium, such as a fluid filter or coalescer medium, prevents pleat deformation and consequent "pinch-off" or blockage of the pleats when the medium is subjected to fluid pressure during use.

3,752,322

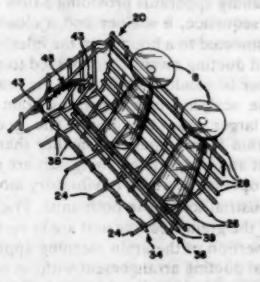
RACK SYSTEM FOR A DISHWASHING MACHINE

John A. Fiocca, and Ernst Grunewald, both of Troy, Ohio, assignors to The Hobart Manufacturing Co., Troy, Ohio

Filed July 8, 1971, Ser. No. 160,869

Int. Cl. A47g *19/08*

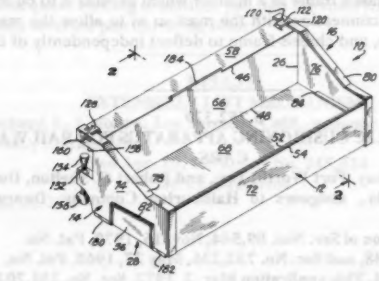
U.S. Cl. 211—41 **7 Claims**



A dish supporting rack includes a series of parallel rows of spaced pins, some of which are rotatably supported for move-

ment between upright dish supporting positions and collapsed positions adjacent the bottom of the rack. The rack also includes means for positively retaining each outer row of rotatable pins at a plurality of intermediate inclined positions where the pins are effective to press against lightweight articles and to hold the articles in fixed relation within the rack while cleaning liquid is being recirculated over and into the articles.

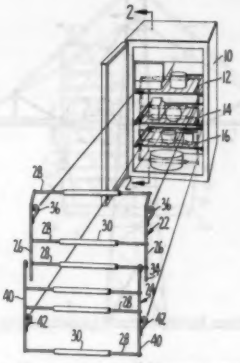
3,752,323
DISPLAY DEVICES
Edward Kayden, 22 Park Place, Great Neck, N.Y.
Filed July 29, 1971, Ser. No. 167,357
Int. Cl. A47f 3/14
U.S. Cl. 211—132 **14 Claims**



A display device for displaying articles carried by the device. The device includes a foldable body of sheet material having top and bottom edges and opposed side edges and divided between its top and bottom edges with a fold line along which the sheet material is folded so that it has a rear wall extending upwardly from the fold line and a second wall extending forwardly from the fold line. A pair of side tabs respectively project laterally from the side edges of the sheet material. A pair of hollow end members respectively have hollow interiors directed toward each other and receiving the side edges of the body of sheet material, these end members having upright walls which are perpendicular to the body of sheet material and which are respectively formed with openings through which the tabs respectively extend. These hollow end members respectively have structures coacting with outer end regions of the tabs for maintaining the body of sheet material assembled with the end members, and a supporting structure coacts with the end members for supporting the latter with the body of sheet material extending therebetween at any desired location. The articles to be displayed are situated between the end members and along the second wall of the body of sheet material in front of the rear wall thereof.

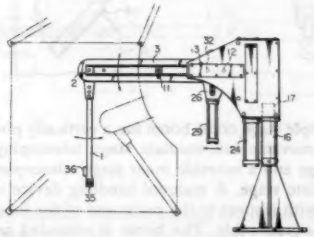
3,752,324
REFRIGERATOR SHELF GUARDS
Howard P. Moser, 685 E. Second St., Sonoma, Calif.
Filed Aug. 13, 1971, Ser. No. 171,617
Int. Cl. A47f 5/00
U.S. Cl. 211—153 **6 Claims**

A shelf guard or fencing system for refrigerators comprising a fence-like barrier member for ready connection to and disconnection from the front edges of refrigerator shelves for the purpose of preventing food items and the like from falling off of the shelves due to tipping of the refrigerator, as occurs on occasion with trailers and mobile homes. The shelf guard is provided with novel means for connecting it to the refrigerator



shelves and the guard is adjustable as to width to adapt it to various sizes of refrigerators.

3,752,325
LOADING BALANCER
Kenji Sato; Kanji Yamazaki, and Isami Tanaka, all of Kanazawa, Japan, assignors to Tsudakoma Industrial Co., Ltd., Ishikawa-ken, Japan
Filed Nov. 16, 1971, Ser. No. 199,102
Claims priority, application Japan, Nov. 17, 1970, 45/100750
Int. Cl. B66c 23/54
U.S. Cl. 212—35 R **6 Claims**

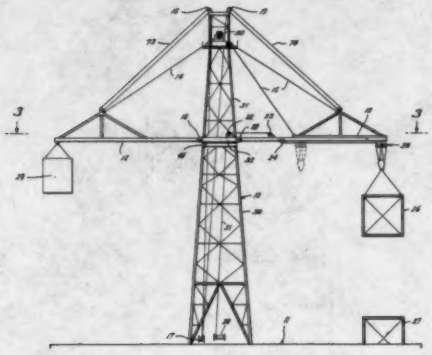


A loading balancer including a pivotal intermediate arm and accompanying main-and auxiliary pressure cylinders wherein changes in the position of the hoisted load in the vertical plane are mechanically converted into corresponding changes in the turning moment about the pivotal point of the intermediate shaft and such changes in the moment are automatically balanced by corresponding changes in the pressure forces provided by the pressure cylinders upon sensing said changes in the moment.

3,752,326
OFFSHORE OIL AND GAS WELL DRILLING RIG
Clarence W. Levingston, Orange, Tex., assignor to Levingston Shipbuilding Company, Orange, Tex.
Filed Feb. 1, 1972, Ser. No. 222,586
Int. Cl. B66c 23/00
U.S. Cl. 212—47 **2 Claims**

An offshore drilling platform and drilling rig mounted

thereon having a load boom assembly and a balance boom assembly mounted for pivotal movement on the derrick of the



drilling rig. The boom assemblies are erected into load bearing position to move loads about the platform.

3,752,327

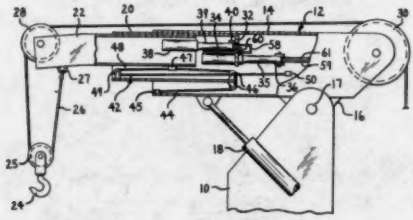
MULTIPLE STAGE CRANE BOOM

John E. Olson, Portland, Oreg., assignor to Hyster Company, Portland, Oreg.

Filed Apr. 29, 1971, Ser. No. 138,431

Int. Cl. B66c *23/06*

U.S. Cl. 212—55 **1 Claim**



A multiple stage crane boom has a vertically pivotable outer stage, a movable intermediate stage telescoping within the outer stage and a movable inner stage telescoping within the intermediate stage. A material-handling device is raised and lowered with respect to the outer end of the inner stage by a winch-powered cable. The boom is extended and retracted through simultaneous extension and retraction of the intermediate and inner stages by separate but simultaneously energized hydraulic cylinders. These cylinders are mounted and hydraulically interconnected in a manner which eliminates the need for extensible hydraulic hoses between the cylinders and the fluid pressure source. A cable-phasing arrangement interconnecting the stages provides in conjunction with the cylinders a boost to ensure proper phasing movement of the movable stages upon extension and retraction should friction tend to restrain one of such stages upon application of hydraulic power to the cylinders.

3,752,328

MOBILE DERRICK

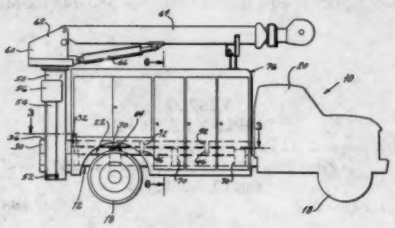
Roy Balogh, Ladue, Mo., assignor to McCabe-Powers Body Company, St. Louis, Mo.

Division of Ser. No. 835,445, June 23, 1969, Pat. No. 3,643,815. This application Nov. 9, 1971, Ser. No. 197,033

Int. Cl. B66c *23/62*

U.S. Cl. 212—145 **18 Claims**

A mobile derrick includes a chassis frame and a mast frame having a rectangular front section rigidly mounted on the chassis frame. A mast is rigidly secured to the mast frame by means of a cross-beam provided at one end of the rectangular front section such that the mast extends upwardly therefrom for supporting a derrick at its upper end. A body is mounted



over the chassis frame in a manner which permits it to be free from rigid connection with the mast so as to allow the mast, mast frame, and chassis frame to deflect independently of the body.

3,752,329

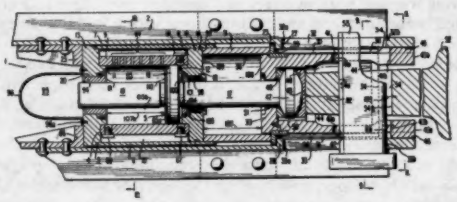
HYDRAULIC CUSHIONING APPARATUS FOR RAILWAY CARS

Orum E. Seay, Fort Worth, Tex., and Robert Q. Shelton, Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Division of Ser. Nos. 89,544, Nov. 16, 1970, Pat. No. 3,647,088, and Ser. No. 732,236, May 27, 1968, Pat. No. 3,568,855. This application Mar. 2, 1972, Ser. No. 231,202

Int. Cl. B61g *9/16*

U.S. Cl. 213—8 **8 Claims**



A cushioning apparatus for railway cars, which apparatus includes hydraulic cylinder means, piston means telescopingly disposed within the cylinder means, stabilizing housing means telescopingly receiving a connection between the piston means and draft means connected with the piston means, and additional movement limiting abutment means engaging or cooperable with the cylinder means and the stabilizing means. The cylinder means includes an inner high pressure cylinder side wall means and an outer relatively lower pressure containing side wall means. A force control means serves to prevent the transmission of cylinder damaging compressive force through the relatively lower pressure containing side wall means when the piston means has moved to its extreme buff position.

3,752,330

PAN TURNING DEVICE

Robert L. Whitmill, Collegedale, Tenn., assignor to McKee Baking Company, Collegedale, Tenn.

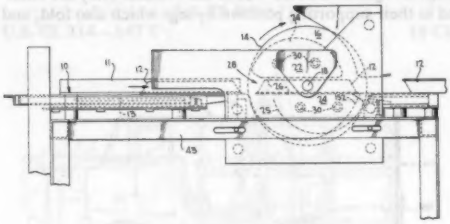
Filed Oct. 18, 1971, Ser. No. 190,070

Int. Cl. B65g *29/00*

U.S. Cl. 214—1 Q **5 Claims**

A high speed turner is disclosed for inverting pans by rotat-

ing them 180°. A feeding means is provided for inserting the pans into the pan turner rotor, which is then rotated 180°.



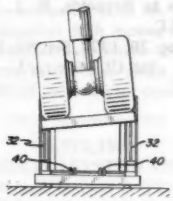
Subsequent feeding of another pan into the rotor forces the already inverted pan out of the rotor.

3,752,331

EXTENSIBLE LIFT MECHANISM

Richard L. Colburn, Los Angeles, Calif., assignor to Fansteel Inc., Chicago, Ill.

Filed Apr. 19, 1972, Ser. No. 245,324
Int. Cl. B60p *1/02*
U.S. Cl. 214—1 A 25 Claims



The invention relates to a lifting mechanism that includes a base frame and a load supporting frame that are operatively interconnected by a scissor linkage. The load supporting frame is raised and lowered on the base frame by screw drives supporting carriers operatively connected to the load supporting frame. The interconnection between the carrier and the load supporting frame includes linkage means that universally accommodate lateral movement of the load supporting frame relative to the axes of the screws to allow the load supporting frame to be tilted relative to the base frame. The device also incorporates air cushioning supports on the base that allow the entire unit to be floatingly supported on a film of pneumatic fluid for final alignment of the support frame relative to a reference point.

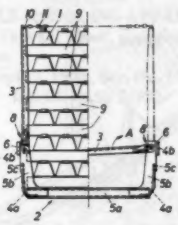
3,752,332

PALLET FOR TRANSPORTING TRACK TIES

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H, Vienna, Austria

Filed Nov. 17, 1971, Ser. No. 199,678
Claims priority, application Austria, Dec. 17, 1970, A 11353/70
Int. Cl. B65g *1/14*
U.S. Cl. 214—10.5 R 5 Claims

A pallet for conveying elongated objects, such as track ties, comprises a bottom support frame and stanchions at the opposite edges of the frame. The stanchions are inwardly pivotal, and balancing means are arranged in the region of each fulcrum for counterbalancing the weight of each stanchion when it is pivoted.

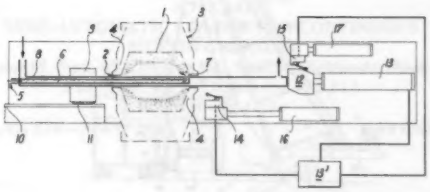


3,752,333

DEVICE FOR AXIAL CHARGING OF A ROTARY MELTING FURNACE

David Yerouchalmi, Le Mesnil Saint-Denis, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Oct. 16, 1970, Ser. No. 81,345
Claims priority, application France, Oct. 24, 1969, 6936564
Int. Cl. F27b *7/32*
U.S. Cl. 214—26 21 Claims



In a rotary melting furnace having two axial openings, a device for axial charging of the furnace comprises a tube which is intended to be introduced along the axis of the furnace through one of the openings. The material to be charged is injected under pressure at one end of the tube together with an addition of volatilizable binder. A lateral orifice is provided at the other end of the tube for injecting the material into the furnace and a drive system is provided for displacing the tube in reciprocating motion.

3,752,334

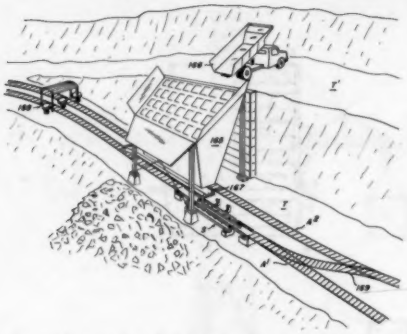
INDUSTRIAL BULK MATERIAL TRANSPORTATION

Melville W. Robinson, Jr., Beaver, and Charles M. Jaco, Jr., Upper St. Clair Twp., Allegheny County, both of Pa., assignors to Dravo Corporation, Pittsburgh, Pa.

Filed Nov. 18, 1971, Ser. No. 199,865
Int. Cl. B65g *67/04*, *67/44*
U.S. Cl. 214—41 20 Claims

An industrial railway is provided wherein a train of cars is propelled along a track by motor-driven friction wheels at intervals along the track which contact friction strips along the sides of the cars. The cars are dumped while the train is moving by successively tilting them sideways, but cooperating

means on the track and cars keep the cars on the track. Unloading stations include adjustable and mobile arrangements



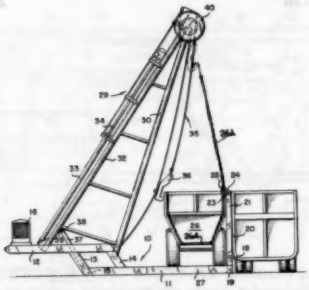
so that dumping of the load may take place at different locations without moving the track.

3,752,335

MOBILE SUGAR CANE WAGON UNLOADER

Ivan Gomez, Thibodaux, La., assignor to Cane Machinery & Engineering Company, Inc., Thibodaux, La.

Filed Apr. 21, 1972, Ser. No. 246,328
Int. Cl. B65g *67/30*
U.S. Cl. 214—44 B **5 Claims**



The present invention is directed to a mobile, transportable sugar cane wagon unloader which may be moved about from site to site by a tractor and which has ramps to receive loaded sugar cane wagons and which has a dumping wall immediately adjacent the ramps so that the unloader can pick up and dump the cane loaded on the wagon over the dump wall into a transport truck to be taken to the mill. When all the cane in a particular land section has been harvested, piled and loaded into cane wagons, transferred to transport trucks and taken to the mill, the device of the present disclosure may then be placed in its transport mode and moved to another harvest area.

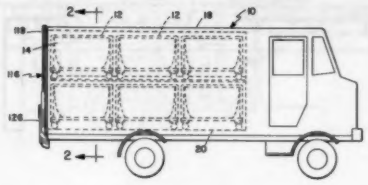
3,752,336

VEHICLE LOADING AND STORAGE SYSTEM FOR WHEELED CONTAINERS

Bobby J. Blount, 530 La Rue Way, El Cajon, Calif.

Filed Mar. 19, 1971, Ser. No. 126,136
Int. Cl. B60p *1/44*
U.S. Cl. 214—75 T **1 Claim**

A vehicle loading and storage system for storing and loading containers within the body of the vehicle comprising a plurality of rows of tracks on at least two levels, each row of tracks being capable of storing a plurality of wheeled containers, and an elevator for raising the containers from ground level, or from a platform, to the height corresponding to the tracks for a given level. The tracks are foldable, or stowable, so as to make the vehicle convertible from the container carrying configuration to a conventional configuration. The folding configuration employs a plurality of track supporting members which pivot against the side wall of the vehicle. They are maintained in their supporting position by legs which also fold, and



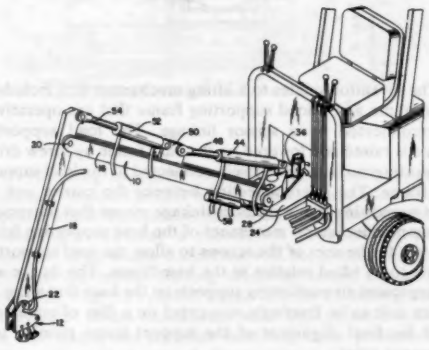
partially retract, to allow a compact folding action of the entire track structure against the side of the vehicle. The stowable configuration employs vertical members which are carried on an overhead longitudinal bar in the use position and stowed on a second overhead longitudinal bar adjacent the side of the vehicle in the stowed position.

3,752,337

DEVICE FOR HANDLING BAGGED OR BUNDLED SOFT MATERIAL

Jesse Randolph Pinkham; Douglas Copeland Clark, both of Winston-Salem, and Donald Ross Wilkinson, Clemmons, all of N.C., assignors to Reynolds, R. J., Tobacco Company, Winston-Salem, N.C.

Filed Aug. 20, 1971, Ser. No. 173,498
Int. Cl. B66c *1/42*
U.S. Cl. 214—147 G **6 Claims**

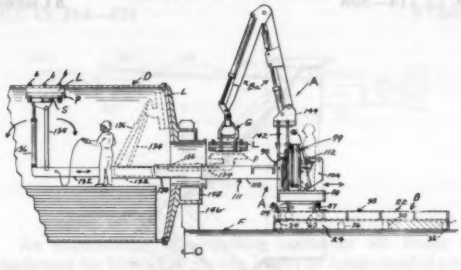


Article transporting apparatus with an articulated two section boom assembly connected at one end to a movable base, for example, a wheeled vehicle to allow rotation of the boom assembly about a vertical axis as well as vertical pivotal movement. A gripper assembly including a pair of swinging gripper arms is pivotally connected at the free end of the boom assembly. A parallel motion control system maintains a a predetermined attitude of the gripper assembly during vertical pivotal movement of the boom assembly. The gripper arms are especially adapted for grasping material subject to tearing, for example, a burlap sheet containing bundled material.

3,752,338
DEVICE FOR LINING A DRUM WITH LINER PLATES

Maurice J. Bartell, Duluth, Minn., assignor to Barko Hydraulics, Inc., Duluth, Minn.

Filed Apr. 5, 1972, Ser. No. 241,308
Int. Cl. B66c 1/10
U.S. Cl. 214—147 T 19 Claims

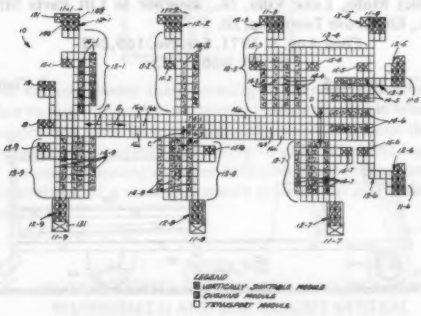


A device for connection with a liner plate at a point without a drum to be lined and moving it into positions within the drum and onto the walls thereof for connection therewith including a retractable boom having an arm pivoted on the outer end of the boom with a platen pivotally mounted on the outer end of the arm and a rack and pinion for pivoting the arm in a plane on the centerline of the boom together with means for pivotally moving the platen on the arm, a head member mounting the other end of the boom on a supporting surface together with means for rotating the boom to rotate the platen with respect to the horizontal axis of the boom, with means for pivoting the boom to move the platen substantially radially of the axis of the boom independent of the means for pivotally moving the platen together with means for positioning said platen at a point without a drum to receive a liner plate thereon and to points within said drum for positioning the liner plate on the walls of the drum for connection therewith.

3,752,339
CARGO HANDLING SYSTEM AND METHOD

Norman M. Sullivan, and Francis J. Fitzgerald, Jr., both of Grand Rapids, Mich., assignors to Rapistan Incorporated, Grand Rapids, Mich.

Division of Ser. No. 703,514, Jan. 23, 1968, Pat. No. 3,592,333. This application July 2, 1970, Ser. No. 60,970
Int. Cl. B65g
U.S. Cl. 214—152 2 Claims

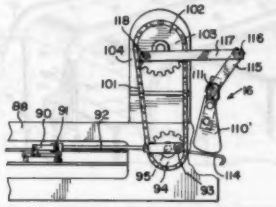


A method of conveying articles from one locationto another on a series of modular conveyor units having self-contained load-driving means. A plurality of individual conveyor modules are controlled from a central control unit such that the articles are automatically transferred according to a predetermined program on a series of related preferred modules until the desired location is reached. In the event a module is occupied by another article, the method includes the step of determining an alternate route to convey the articles to the desired location.

3,752,340
ARTICLE HANDLING APPARATUS

Charles H. Willsey, Topeka, Kans., assignor to Seymour Foods, Inc., Topeka, Kans.

Filed Sept. 7, 1971, Ser. No. 177,931
Int. Cl. B65b 21/02
U.S. Cl. 214—314 16 Claims

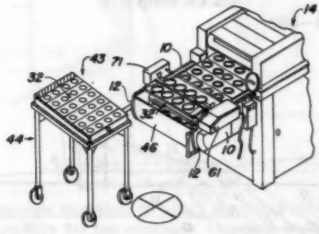


An apparatus for loading egg processing or handling equipment which comprises a swingably mounted support frame on which loaded filler flats may be placed in upright position with an associated, swingably mounted conveyor which is operable to hold the eggs on the filler flats while they are inverted by rotation of the support frame for deposit of the eggs on the conveyor and for advancing the eggs to an accumulator table when in a generally horizontal position, the eggs being deposited on the conveyor by retraction of the support frame and removal of the inverted filler flats. The accumulator table serves as a reservoir from which the eggs are transferred in parallel lines or row formation.

3,752,341
SEMI-AUTOMATIC LOADER FOR CONTINUOUS MUFFIN GRIDDLES

Eugene M. Noel, 42 Kingston Rd., Newton Highlands, Mass.

Filed Sept. 17, 1971, Ser. No. 181,513
Int. Cl. B65g 47/04
U.S. Cl. 214—314 10 Claims

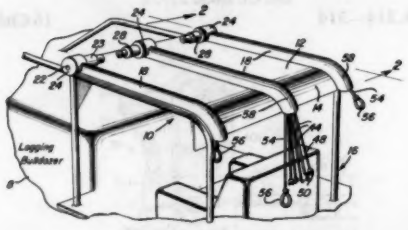


A semi-automatic dough piece feeding process, and apparatus capable of being used in practicing the process, for the loading of continuous griddles of the conveyor type, comprising the steps of placing dough pieces on a tray having a plurality of positioned cups, placing a multiplicity of trays in a drawer on a mobile rack conveniently located aside the infeed end of the continuous griddle, removing a tray from the drawer and engaging it in a locating assembly mounted to the infeed end of the continuous griddle, up-ending the tray thus engaged to deposit the dough pieces thereon into receiving cups positioned on an auto-turn assembly mounted to the infeed end of the continuous griddle, dumping of the dough pieces from the receiver cups into positioned griddle cups on the moving conveyor flight, and returning the empty tray to starting position and removal therefrom ready for a repeat cycle.

3,752,342
VEHICLE MOUNTED CHOKER CABLE STORAGE MEANS

Ray C. Stevens, and Joe E. Stevens, both of P.O. Box 173, Kootenai, Idaho

Filed Aug. 27, 1971, Ser. No. 175,616
Int. Cl. B60r *9/04*
U.S. Cl. 214—450 5 Claims

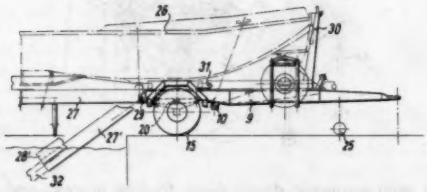


Time and labor saving dispensing means by way of which short cables, designated as chokers, can be systematically, protectively and readily stored for selectively withdrawable use. Almost any logging job requires the use of a multiplicity of choker-cables ranging from eight to ten feet in length and which, as is known, are used to wrap around logs so that the wrapped logs can be dragged to a decking or loading area. To cope with this storage problem means is mounted accessibly atop an available roof of a canopy embodied, for example, in a logging bulldozer. For the result desired a plurality of tubes are mounted atop a canopy roof, each tube having self-contained facilities in which the withdrawable chokers are orderly stored in a manner to reduce intertwining to an acceptable minimum.

3,752,343
MOVABLE CARRIER FOR A WATERCRAFT

Franz Krautkremer, Muhren, Germany, assignor to Schottel-Werft, Josef Becker KG, Spay/Rhein, Germany

Filed Sept. 13, 1971, Ser. No. 179,987
Claims priority, application Germany, Dec. 12, 1970, G 70 45 952.8; Mar. 22, 1971, G 71 10 776.1
Int. Cl. B60p *3/10*
U.S. Cl. 214—505 5 Claims

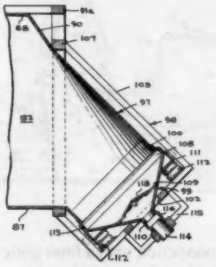


A boat trailer having an intermediate carriage provided for receiving the boat thereon and movable with respect to the trailer frame. The boat trailer has a light weight frame which is mounted on a single axle which axle in turn is mounted to the trailer frame by leaf springs. Hollow rubber bumpers are interposed between the axle and the frame and vibration (shock) absorbers are also positioned between the wheel axle and the frame. A single support guide or rail extends centrally of the trailer frame and supports a carriage thereon for longitudinal movement with respect thereto. Said carriage supports the boat. A winch is provided on the carriage to draw the boat onto the carriage and the winch is provided on the trailer frame to draw the carriage onto the trailer frame.

3,752,344
BULK MATERIAL HANDLING SYSTEM

Edwin E. Clarke, Allentown, and Albert J. Florig, Norristown, both of Pa., assignors to Bulk Liner Corporation, Allentown, Pa., by said Clark

Division of Ser. No. 1,078, Jan. 7, 1970. This application Aug. 26, 1971, Ser. No. 175,389
Int. Cl. B60p *1/58*
U.S. Cl. 214—508 8 Claims

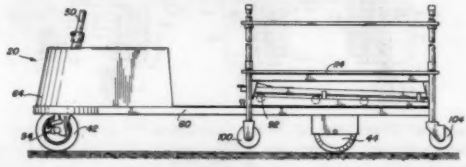


A bulk material handling system generally including a carrier for transporting bulk material, the carrier having an opening closed by a rupturable panel, means for supporting the carrier, means for tilting the support means to cause the bulk material within the carrier to gravity flow toward the closed opening when the carrier is positioned on the support means, a rigid upright frame structure mounted on the support means, a rigid panel mounted on the upright frame structure, movable into engagement with the rupturable panel when the carrier is positioned on the support means, for supporting the weight of the bulk material within the carrier when the support means is tilted to cause the bulk material to flow toward the closed opening, and the rigid panel having discharge means through which bulk material within the carrier may be conveyed and discharged when the rigid panel engages the rupturable panel on the carrier, a portion of the rupturable panel is ruptured to intercommunicate the interior of the carrier and the interior of the discharge means and the support means is tilted to cause the bulk material within the carrier to gravity flow towards the closed opening and into the discharge means.

3,752,345
STOCK PICKER ASSEMBLY WITH SELF-CONTAINED DRIVE MEANS

Benedict Molis, Lake Villa, Ill., assignor to Lift Parts Mfg., Inc., Elk Grove Township, Ill.

Filed Aug. 5, 1971, Ser. No. 169,242
Int. Cl. B60p *1/52*
U.S. Cl. 214—515 7 Claims

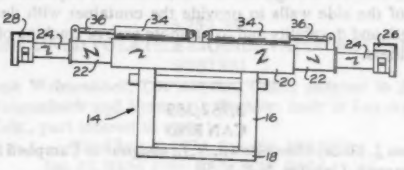


A motor-driven truck adapted for use as a prime mover and including means for engaging and for supporting and propelling an auxiliary conveyance such as a cart, the truck including a frame-carried friction-reducing bed defining a support base for the cart bearing thereupon, and means for positioning the cart on the truck for transport thereby.

3,752,346
EXPANDABLE SIDE-HANDLING CONTAINER ATTACHMENT

Norman D. Thompson, and Charles R. Chelin, both of Dallas, Oreg., assignors to Towmotor Corporation, Cleveland, Ohio

Filed Oct. 1, 1971, Ser. No. 185,699
Int. Cl. B66f 9/18; B66c 1/42
U.S. Cl. 214—621 8 Claims

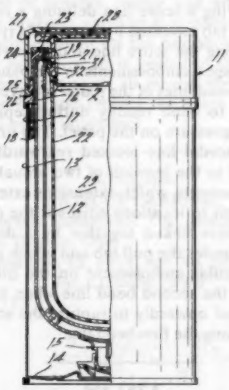


An expandable, side-handling container lift frame attachment for lifting and moving empty or lightly loaded cargo containers of various lengths is provided. The lift frame attachment is adapted for attachment to or detachment from a carriage of a fork-lift truck, and includes telescoping, transverse beam members that can be extended or retracted in length to fit intermixed containers of various lengths.

3,752,347
CLOSURE FOR LINED VACUUM BOTTLE

Vernon D. Bell, Westerly, R.I., assignor to King-Seeley Thermos Co., Norwich, Conn.

Filed Feb. 2, 1971, Ser. No. 111,848
Int. Cl. A47j 41/00
U.S. Cl. 215—13 R 2 Claims



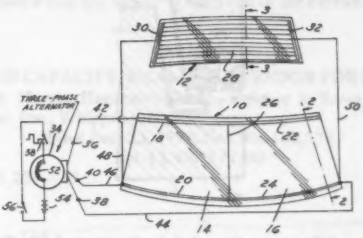
A vacuum bottle incorporating a liner for protecting the glass vacuum filler. A closure construction is used in which the stopper and liner have cooperating sealing surfaces that are disposed at an angled relationship to each other. At least one of the angled sealing surfaces is flexible for deformation upon the exertion of a sealing pressure to establish and maintain a good seal.

3,752,348
MOTOR VEHICLE ELECTRICALLY HEATED WINDSHIELD AND BACKLIGHT SYSTEM

Richard T. Dickason, Birmingham; Donald J. Ray, Southgate, and Charles D. Simmons, Dearborn Heights, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 30, 1971, Ser. No. 176,083
Int. Cl. H05b 1/02, 3/26; E06b 7/12
U.S. Cl. 219—203 1 Claim

A system is described for electrically heating a motor vehicle windshield and backlight. The system includes a windshield having at least two conductive surfaces and a backlight having at least one conductive surface. Each of the conductive surfaces is provided with a pair of bus bars spaced from one another to permit flow of electrical charge therebetween via the conductive surfaces. This generates heat in the windshield and backlight for defogging and defrosting purposes. The system includes a three phase alternator having the conductive surfaces of the windshield and backlight con-

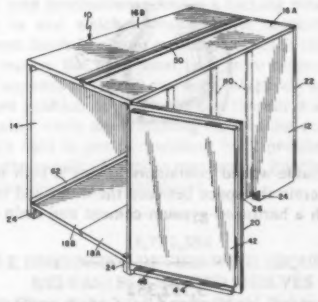


nected thereto to provide substantially balanced loading of the alternator phases. The alternator may have a field winding supplied by a dc source of electrical energy located in the motor vehicle. A switch connected in series with the field winding may be provided to energize the system. Over-temperature protection for the alternator may be achieved by the provision of a thermostat also connected in series with the alternator field winding.

3,752,349
COLLAPSIBLE CONTAINER

Sudhir N. Rana, Del Mar, Calif., assignor to Flexogenics, Inc., Solana Beach, Calif.

Filed Mar. 15, 1971, Ser. No. 123,952
Int. Cl. B65d 7/26, 9/14
U.S. Cl. 220—6 10 Claims



A collapsible container in which the doors at opposite ends provide rigidity for the structure. Opposed walls of the container are hinged to fold inwardly between the other walls, the doors folding back against the outside of the structure. In the erected position the doors have plug portions which fit closely into the ends of the box structure and maintain the alignment and rigidity of the walls. The hinges used in the structure are sealed on both sides to make the container weatherproof.

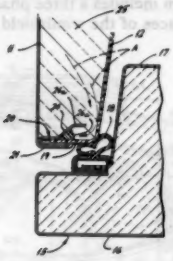
3,752,350
REFRIGERATOR CABINET CONSTRUCTION

Howard S. Franck, Oxford, Ohio, assignor to Philco-Ford Corporation, Philadelphia, Pa.

Filed Sept. 28, 1971, Ser. No. 184,466
Int. Cl. B65d 25/18
U.S. Cl. 220—9 G 1 Claim

A refrigerator cabinet having a metallic outer shell, a plastic inner liner spaced therefrom, and foamed-in-place insulation

filling the space between the shell and liner. The outer shell includes a forwardly positioned, inwardly facing channel that receives a flanged forward portion of the liner to provide an access opening for the compartment defined by the liner. One leg portion of the channel is spaced inwardly of the access



opening and has a section that is divergent from the liner flange and extends into the insulation. A strip of pliant sealing material is received within the wedge-shaped recess formed by the divergent section and the liner flange, and is urged into tight sealing engagement by the expansion of the foamed insulation.

3,752,351
HIGH IMPACT RESISTANT DOUBLE-WALLED CONTAINER

Kanjiro Nagata, 9-chome 1 Banchi Yasunaka-cho Yao-chi, Osaka, Japan

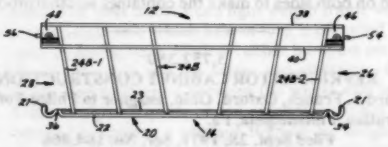
Continuation-in-part of Ser. No. 63,917, Aug. 14, 1970. This application Jan. 27, 1971, Ser. No. 110,109
Claims priority, application Japan, Sept. 6, 1969, 44/70781
Int. Cl. B65d *25/18*
U.S. Cl. 220—9 R **2 Claims**

Plastic double-walled containers having a high impact-resistance wherein the space between the outer and inner walls is filled with a hardened gypsum cement and resin combination.

3,752,352
STACKABLE NESTABLE CONTAINER

Yvan Senecal, 347 Tait Cres., St. Laurent, Montreal 378, Canada

Filed July 8, 1971, Ser. No. 160,829
Int. Cl. B65d *7/20, 21/02*
U.S. Cl. 220—19 **15 Claims**

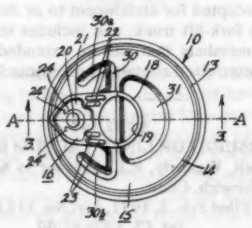


An open-ended stackable and nestable wire container having a base, two opposite substantially vertical side walls and a pair of transversely extending bails journalled at their respective ends to the opposite upper corners of the side walls. The bails are swingable inwardly to permit continuous stacking of like containers, or the bails may be swung outwardly to permit continuous nesting of like containers. The container is constructed substantially entirely from wire and the side walls of the container have a thickness of approximately two wire diameters. The end walls of the container are substantially open to permit free access to the goods stored in the container, and the swingable bails interconnect adjacent upper ends of the side walls to provide the container with desired strength and durability and to promote ease of stacking of like containers.

3,752,353
CAN END

William J. Slade, Moorestown, N.J., assignor to Campbell Soup Company, Camden, N.J.

Filed Jan. 24, 1972, Ser. No. 220,359
Int. Cl. B65d *17/24*
U.S. Cl. 220—54 **2 Claims**

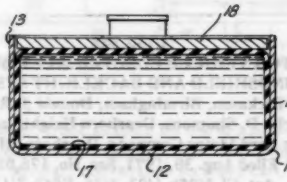


A can end having a score line defining a removable panel and a lanced pull tab mounted by means of a rivet on the panel for use in rupturing the score line and removing the panel is provided with shaped embossments in the panel for providing first and second bend lines in the panel transverse to the tab to cause the panel to bend readily during separation without requiring thumb pressure on the panel. The first bend line extends along a chordal line located rearwardly adjacent the rivet and tangent to the terminii of two arcuate extensions of one of the embossments, which extensions extend peripherally from their terminii to locations adjacent the diameter of the panel and are there linked together by a depressed region which is located under the pull tab and which cooperates with another semi-circular embossment on the other half of the panel to provide the second bend line when the tab is pulled after being pivoted upwardly to rupture the score line and to bend the panel along the first bend line.

3,752,354
CONVERTIBLE TRANSPORTING DEVICE

Galip Demirag, Beyaglu Tokatliyan Ishani, Kat: 5 No: 40, Istanbul, Turkey

Filed July 30, 1971, Ser. No. 167,589
Int. Cl. B65d *25/14*
U.S. Cl. 220—63 R **3 Claims**



A convertible transporting device in which a flexible fluid containing bag is supported in an open top container. The

flexible bag fills the container when full of fluid and lies in the bottom of the container when empty. A support platform forms a movable top wall in the container supported by the bag. The platform moves downwardly in the container as the bag empties and with the bag completely empty forms a floor in the bottom portion of the container overlying the bag. With the bag empty and the platform in its lowermost position, dry freight can be stacked on the platform within the container to provide a pay load on the reverse trip.

3,752,355

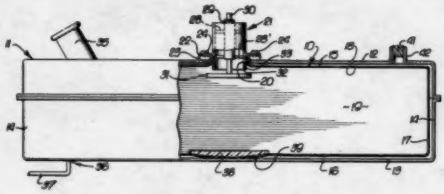
CONTAINED VOLATILE LIQUIDS VAPOR RETENTION SYSTEM

Joseph Weissenbach, Los Angeles, Calif., assignor to Joseph Weissenbach and Vernon D. Beehler, both of Los Angeles, Calif., part interest to each

Filed Jan. 5, 1971, Ser. No. 104,079

Int. Cl. B65d *3/00*; B67c *3/00*; B65d *51/16*

U.S. Cl. 220—86 R **13 Claims**



A tank for volatile fuel has a flexible bag inside with its own breather valve separate from the fill pipe for the tank. When the tank is filled, a muff around the fill pipe seals the tank against exhaust of volatile vapors and air from the bag is forced out the breather valve as it is displaced by the liquid fuel until a valve element on the bag shuts off the breather valve,whereby only pure air is vented to the atmosphere. As the tank empties during use, air returns through the breather valve to fill the bag and replace the space in the tank previously occupied by the liquid fuel.

3,752,356

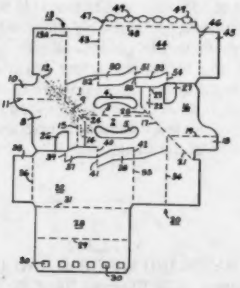
ARTICLE CARRIER

Homer W. Forrer, Jonesboro, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Dec. 13, 1971, Ser. No. 207,491

Int. Cl. B65d *75/00*

U.S. Cl. 220—113 **8 Claims**



An article carrier of the basket style comprises a bottom wall, a pair of side walls foldably joined respectively to opposite side edges of the bottom wall, a pair of end walls foldably joined at each end edge thereof to corresponding end edges of different side walls, a pair of anchoring panels affixed in face contacting relation to the end walls respectively and each anchoring panel having one vertical edge disposed medially of the associated end wall and constituting means for securing to the associated end wall a riser panel which is foldably joined to the vertical edge of each anchoring panel and which extends upwardly above the top edges of the end walls to form a means for connecting the handle to the carrier, the handle comprising a pair of handle panels secured in face contacting relation to each other and disposed about the upper portions of the riser panels. A handle reinforcing panel may be foldably joined to the top edge of each riser panel and disposed between the riser panel and one of the handle panels to provide a four ply handle at each end of the carrier.

3,752,357

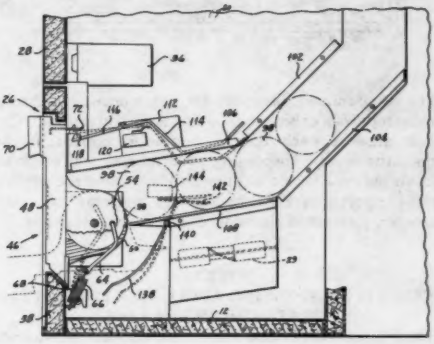
HIGH CAPACITY, SMALL SIZE VENDOR FOR CANS

John A. Harris, Hagerstown, Md., assignor to Rowe International, Inc., Whippany, N.J.

Filed Dec. 23, 1970, Ser. No. 100,979

Int. Cl. G07f *11/00*

U.S. Cl. 221—17 **1 Claim**



A small size, high capacity merchandising machine for dispensing canned goods such as beverages in cans in which a common coin mechanism releases a locking means which is common to and which normally holds respective pivoted escapement doors in closed positions at which compartments thereon receive the lowermost cans from respective gravity feed can supplies to permit one door selectively to be pivoted to an open position at which the can therein is accessible to the customer while the remaining cans in the corresponding supply are held in position without back pressure being exerted on the supply. A simple mechanical interlock prevents concomitant opening of both doors.

3,752,358

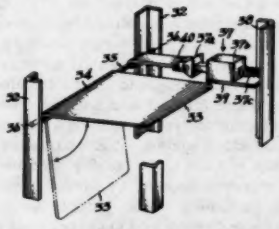
ARTICLE DISPENSING DEVICE WITH SEQUENTIALLY RELEASABLE HINGED SHELVES

Kiyomitsu Ohno, Naka 2-9-9 Kunitachi-shi, Tokyo, Japan

Filed June 25, 1971, Ser. No. 156,880

Int. Cl. G07f *11/06*

U.S. Cl. 221—90 **8 Claims**



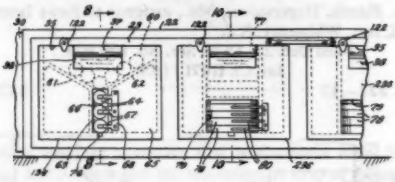
A shoes receiving box wherein a plurality of shelf plates is disposed with a fixed spacing between the adjacent ones in the

vertical direction in the box, and wherein every time a coin is thrown in or a push-button is depressed, bowling shoes, skates or the like respectively placed on the shelves fall down successively from the bottom to be delivered to a taking-out port provided at the lower part of the box.

3,752,359
PROGRAMMED DISPENSERS

Joseph Denman Shaw, 508 Church St., Brownsville, Pa.

Filed Feb. 28, 1972, Ser. No. 229,770
Int. Cl. B65g *1/00*
U.S. Cl. 221—5 **11 Claims**

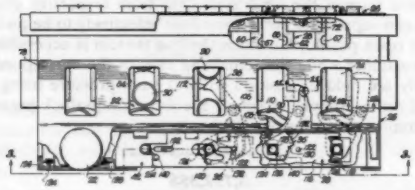


The programmed dispenser for pharmaceuticals disclosed herein employs a cabinet containing a plurality of individually coded drawers each having a pharmaceutical magazine cooperative with a dispensing slide means, and an indexed selector means adapted to periodically receive the cabinet to thereby operate a slide means and dispense one or the prescribed number of pharmaceuticals from a magazine.

3,752,360
SELECTIVE DISPENSING APPARATUS FOR BOTTLED PRODUCTS OR THE LIKE

Herman R. Craven, Prairie Village, Kans.; John W. Baxendale, Kansas City, and Charley W. Hunter, Raytown, both of Mo., assignors to The Vendo Company, Kansas City, Mo.

Filed Aug. 18, 1972, Ser. No. 281,632
Int. Cl. B65g *59/06*
U.S. Cl. 221—125 **18 Claims**

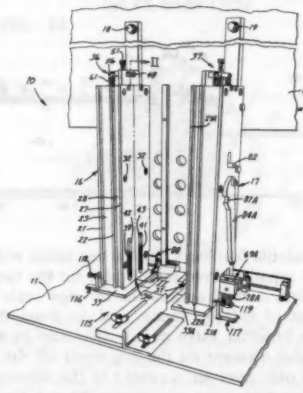


A simple, reliable, economical, primarily mechanical, normally low capacity, selective dispensing apparatus is provided for use in vending products such as bottled beverages or the like. The apparatus utilizes customer actuated mechanical means for selecting and releasing products after proper credit has been established and is adapted for single or dual price operation. Bottled products are stored by suspension of their necks on inclined pairs of parallel rails along which they are gravity fed as required to releasing stations where the lowermost bottles are normally engaged and held against release by the customer actuable product selecting and releasing means. The product selecting and releasing means are restrained by a captive link mechanism against actuation of more than one of same at one time and are also normally restrained, in one or more price dependent groups, by credit operable locking means against actuation until proper credit has been established. Coinage deposit by a customer need provide only a brief, single, electrical pulse for momentarily actuating a credit solenoid of particular price significance in order for such solenoid to unlock the locking means, thereby simplifying the requirements for coin handling accessories. Once unlocked, the locking means is held in unlocked condition by latching means that is, in turn, released by actuation of any product selecting and releasing means to restore the locking means to its locked condition until credit has again been established.

3,752,361
PANEL SUPPORTING AND LIFTING DEVICE

Ronald C. VanLinder, Watervliet, and Basil R. VanLinder, Kalamazoo, both of Mich., assignors to Winkel Machine Company, Inc., Kalamazoo, Mich.

Filed June 23, 1972, Ser. No. 265,505
Int. Cl. B65g *59/00*
U.S. Cl. 221—251 **8 Claims**



A panel feeding machine for removing the bottom panel from an upstanding stack of panels. A supporting and lifting device is provided for laterally supporting the stack and for lifting at least a portion thereof. The supporting device includes a pair of upstanding and spaced guide walls separated by the stack. The supporting device is secured to a frame which is adapted to permit a lateral movement of the guide walls with respect to the frame so that stacks of different widths may be accommodated. The lifting device is mounted on each of the guide walls and is movable therewith. The lifting device includes a jaw assembly mounted for lateral movement with respect to the guide walls for gripping the stack therebetween and lifting the upper portion of the stack to remove the weight of the upper portion of the stack from the lower panels thereof. A control is provided for controlling the gripping force of the jaw assembly in response to the weight of the upper portion of the stack.

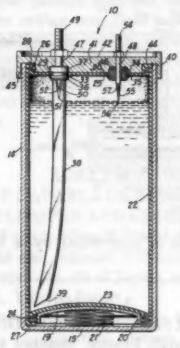
3,752,362
LIQUID HANDLING METHOD AND APPARATUS

George A. Risener, 5675 Rosewell Road, N. E., Apt. 47 E, Atlanta, Ga.

Filed Dec. 16, 1971, Ser. No. 208,856
Int. Cl. B67b *7/24*
U.S. Cl. 222—85 **9 Claims**

A liquid handling method and apparatus wherein the apparatus includes an outer container having an open top, a closed disposable inner liner containing a predetermined amount of the liquid positioned within the outer container and

having a top capable of being ruptured, and a cover for securing over the outer container, the cover having means to rupture the top of the inner liner to provide a means of withdrawing the liquid.

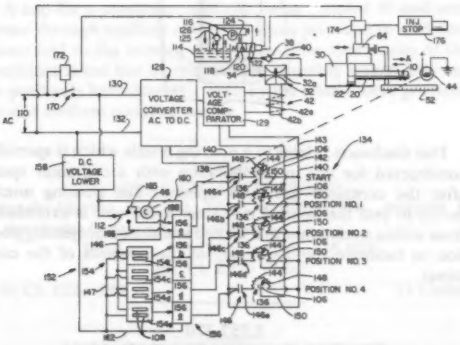


3,752,363

CONTROL FOR INJECTION MOLDING MACHINE

Donald Fegley, Lakewood; Sobhy T. Khalil, Mayfield Heights; Carl M Lrick, Mentor, and Leonard P. Nypaver, Westlake, all of Ohio, assignors to Van Dorn Plastic Machinery Company, Cleveland, Ohio

Filed Nov. 12, 1971, Ser. No. 198,398
Int. Cl. B29h *5/24*
U.S. Cl. 222—63 11 Claims



Variations in the longitudinal speed of movement of the screw of a plastic injection molding machine is achieved by control means which function to provide for speed changes to occur at preselected positions of the screw relative to the injection stroke thereof. The screw speeds and the positions of the screw at which speed changes occur are manually settable by corresponding pairs of dials on a control board positioned at the machine and which dials readily provide visual indication of the speed and position settings.

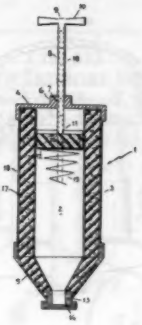
3,752,364

CONTAINER FOR ICE CREAM

Robert De Vries, 2 Valeriusstraat, The Hague, Netherlands

Filed Jan. 21, 1971, Ser. No. 108,261
Claims priority, application Netherlands, Feb. 9, 1970, 7001774
Int. Cl. B67d *5/42*
U.S. Cl. 222—131 1 Claim

A container for insulating, transporting and also dispensing ice cream, comprising an insulated cylindrical casing with end closures and a plunger to exert an urging pressure for the dispensing of the ice cream.

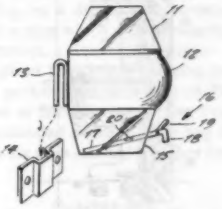


3,752,365

BATH ROOM MOUTH WASH DISPENSER

Mary E. Coleman, 20 N. Main Ave., Apt. 36, Atlantic City, N.J.

Filed Nov. 1, 1971, Ser. No. 194,198
Int. Cl. B67d *5/12*
U.S. Cl. 222—181 1 Claim



A container for dispensing mouth wash in a convenient manner, thedevice comprising a special bottle consisting of a clear plastic cover that screws down on a solid colored central body having a clear plastic bottom member therebelow, the bottom member being provided with a tiltable dispensing spigot for discharging the mouthwash, and the bottle being attachable to a bracket mountable on a wall of a bathroom so that is handy for use to all.

3,752,366

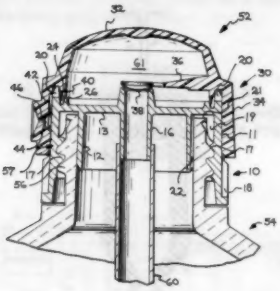
TWO-PIECE SUCTION PUMP

William John Lawrence, Jr., 33 Helen Pl., Clifton, N.J.

Filed Oct. 27, 1971, Ser. No. 193,102
Int. Cl. B65d *37/00*; F04b *43/00*
U.S. Cl. 222—207 13 Claims

An inexpensive, easily assembled two-piece liquid dispensing pump for a container. A relatively rigid cap member, having a central passageway into the container, is engaged to the finish or mouth portion of the container. A deformable member having a resilient dome is engaged to the cap member and cooperates therewith to define a fluid receiving chamber. The deformable member has (1) an integral check valve adapted to close the cap member's central passageway, (2) integrally molded fluid passages in a depending skirt, and (3) a fluid dispensing orifice integrally molded into the depending skirt and connected to the fluid passages. The pump, when in position on a container filled with liquid, is

operated by sequential depression and release of the dome of the deformable member, thereby creating a partial vacuum to



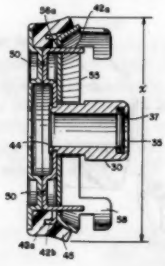
draw liquid from the container into the chamber from which it is dispensed.

3,752,367

PLUNGER ASSEMBLY FOR HAND-OPERATED GREASE GUN

Edwin P. Sundholm, P.O. Box 108A, R.R. No. 1, Albert City, Iowa

Filed June 26, 1972, Ser. No. 266,448
Int. Cl. G01f *11/00*
U.S. Cl. 222—256 **6 Claims**



A plunger assembly for use in hand operated grease guns which have a cylindrical grease container with a rod extending axially therein and which are adapted for use with both bulk-filled and cartridge-packaged greases; said plunger assembly comprises a cylindrical sleeve with a bore therethrough carrying a sealing ring to provide a sliding, grease-tight seal with said rod, a guide assembly rigidly mounted on said sleeve which receives and secures an annular flexible sealing means with rearwardly extending sidewalls and a plunger cup slidably mounted on said rod which engages said sidewalls in operation to urge them outward by a pivotal flexing action to selectively provide a sliding, grease-tight fit around the outside of the plunger assembly.

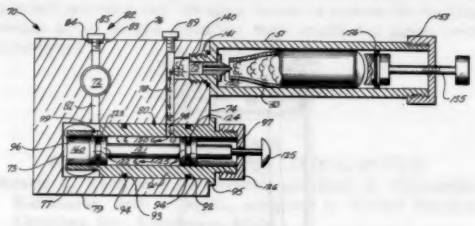
3,752,368

AIRLESS LIQUID SPRAYING DEVICE

Harry L. Robertson, 210 N. Angeleno Ave., Azusa, Calif.

Filed Oct. 12, 1971, Ser. No. 188,140
Int. Cl. G01f *11/38*
U.S. Cl. 222—327 **12 Claims**

A liquid spraying device employs compressed gas to urge a piston to slide in a tank and pressurize the liquid contained therein. The liquid is forced through a trigger operated liquid release valve and flows through a tip for mechanical atomization. Compressed gas is admitted into the tank through a pressure control valve which opens momentarily when a connected pushbutton is depressed and closes automatically in response to build up of pressure in a back pressure area. A commercially availiable cartridge is the preferred source of



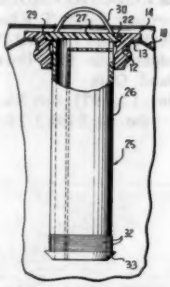
compressed gas and is supported by a holder part of the device.

3,752,369

CONTAINER SPOUT AND POURING NOZZLE

Michel Robert, Bihorel, France, assignor to J. J. Carnaud & Forges De Basse-Indre S.A., Paris, France

Filed July 2, 1971, Ser. No. 159,214
Claims priority, application France, July 6, 1970, 7024925
Int. Cl. B67d *3/00*
U.S. Cl. 222—481 **12 Claims**



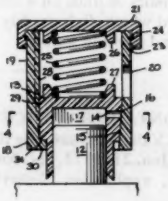
This disclosure relates to a pouring nozzle which is specially constructed for use in combination with a container spout after the container has been opened. The pouring nozzle serves to seal the opened container spout and is extendable from within a container to a locked and sealed projecting position to facilitate the dispensing of the contents of the container.

3,752,370

SHUTTER-TYPE VALVE MECHANISM

Richard L. Davenport, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Mar. 26, 1971, Ser. No. 128,295
Int. Cl. F16k *23/00*
U.S. Cl. 222—514 **8 Claims**



In association with a dispensing valve for controlling the outflow of the contents from a pressurized container which

has a discharge orifice in a body surface, there is provided a closure member movable relative to the surface. When the closure member is in position for occluding the orifice an arrangement causes the closure member to bear against or be pressed down on the orifice into fluid sealing relationship. In one form of the invention the closure member approaches the orifice with a wedging action while in another form it is spring biased towards the orifice. In another form an interference fit is developed between the closure member and the surface surrounding the orifice.

3,752,371

CONTAINER CAP CAPABLE OF BEING RESILIENTLY HELD OPEN AND CLOSED

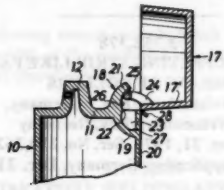
Rinnosuke Susuki, Tokyo; Hiroshi Hoshi, Chiba-ken; Shinichi Araki, Funabashi-shi; Shinzo Miyamoto, Soka-shi, and Masao Ishii, Yachiyo-shi, all of Japan, assignors to Lion Fat and Oil Co., Ltd., Tokyo, Japan

Filed July 23, 1971, Ser. No. 165,635

Claims priority, application Japan, July 24, 1970, 45/74303; July 31, 1970, 45/76842

Int. Cl. B67d *5/06*

U.S. Cl. 222—182 3 Claims



A cap for a container, said cap being coupled to said container through resilient coupling means provided to said container and to the interior of said cap. The appearance of the container is not lost by the resilient coupling means. The cap be positively held closed or open by the elastic force provided by said resilient coupling means.

3,752,372

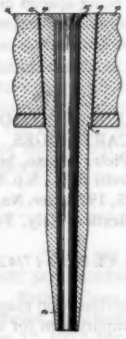
CLAY-GRAPHITE SPOUT

Francis Marion Mitchell, III, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Filed Apr. 20, 1971, Ser. No. 135,672

Int. Cl. B22d *37/00*

U.S. Cl. 222—566 11 Claims



A pouring spout for pouring molten metal in a continuous casting system, the composition of said pouring spout including, among other substances, graphite, clay, refractory oxides and other refractory materials, wherein the percentages of each substance vary within a specified range according to the purity of metal being poured. The internal configuration of the spout results in a closely controlled and consistent flow of molten metal.

3,752,373

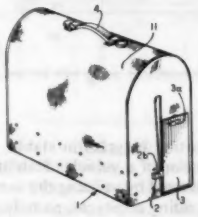
PORTABLE WARDROBE REFRESHER

Sally J. Smith, 299 Lyons Ave., Newark, N.J.

Filed Mar. 8, 1972, Ser. No. 232,704

Int. Cl. A41h *43/00*

U.S. Cl. 223—51 5 Claims



A conventional bag for hanging and transporting clothes is fitted at its lower end with a pair of superposed rectangular compartments. The bottom compartment contains steam generating means, whereas a compartment just above the bottom compartment contains a hot air blower. The aforesaid compartment is separated from the upper clothes carrying portion of the bag by a drainboard partition, at whose low point is centered a pipe which drains collected liquid into the steam compartment. Generated steam is transmitted uniformly throughout the clothes carrying portion of the bag through spaced perforations in a pair of flexible or hinged pipes which serve as part of a supporting frame when the bag is in vertically extended position. The bag is constructed to double over with the ends latched together for carrying.

3,752,374

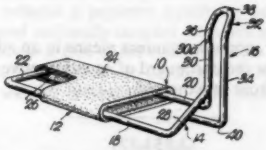
NECKTIE KNOT-FORMING TOOL

George M. Pro, 9307 Lee Blvd., Leawood, Kans.

Filed Jan. 3, 1972, Ser. No. 214,799

Int. Cl. A47j *51/06*

U.S. Cl. 223—111 8 Claims



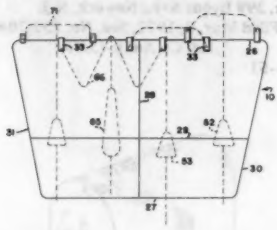
A tie shaper in the nature of a hand tool for use as an aid in the formation of a necktie knot by gathering the necktie material into a dimple within and below the knot, has a pair of dimple-forming elements which are placed on opposite sides of the front panel of the tie and then slipped upwardly into the knot while the latter is still loose. As the elements are thereupon compressed toward each other, the tie material of the front panel is gathered and drawn into one of the elements, forming the dimple. Then the tool is removed and the dimple is held in place by hand as the knot is tightened onto the dimple.

3,752,375

VEHICLE-MOUNTED BICYCLE CARRIER

William Weigl, 11033 Greenhaven Pky., Becksville, Ohio

Filed Feb. 16, 1971, Ser. No. 115,340
Int. Cl. B60r 9/10
U.S. Cl. 224—42.03 B 10 Claims



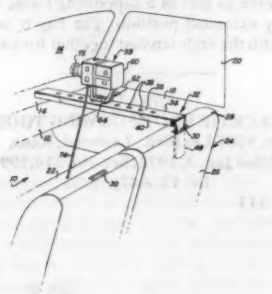
Carrier for supporting bicycles in stable, inverted vertical position on the exterior of a vehicle. Stability of the bicycles while inverted is achieved by utilizing the same three points of support used when riding a bicycle, namely, the seat and the two extensions of the handlebars. A plurality of bicycles may be carried in this fashion by nesting them in staggered front-to-back relationship on the carrier.

3,752,376

AUTOMOTIVE VEHICLE SUPPORTING MEANS FOR CAMERAS

Forest G. Shelton, 10421 Thorpe Ave., Overland, Mo.; Robert L. Woodruff, 435 Ryan Dr., Florissant, Mo., and Homer W. Shelton, 9970 Page Blvd., Overland, Mo.

Filed July 29, 1971, Ser. No. 167,233
Int. Cl. B60r 11/04
U.S. Cl. 224—42.45 B 11 Claims



A bracket for mounting camera means in an adjusted position intermediate the dashboard of an automotive vehicle and the back of the front seat thereof.

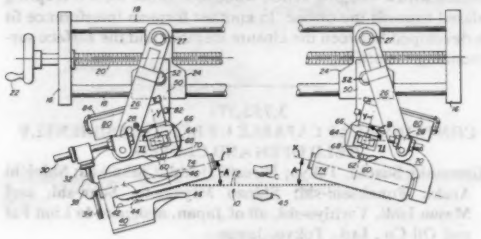
3,752,377

METHOD AND APPARATUS FOR CONTROLLING LATERAL SPACINGS OF ELONGATED ELEMENTS

George P. Knapp, Waban, Mass., assignor to Mount Hope Machinery Company, Taunton, Mass.

Filed Sept. 1, 1972, Ser. No. 285,838
Int. Cl. B65h 25/26
U.S. Cl. 226—3 20 Claims

The spacings or relative lateral positions of elongated elements, such as tire cord or the warp threads of woven material, are controlled to obtain a uniform distribution. A pair of rolls are inclined at fixed angles to a plane in which the elements travel, to engage opposite edge portions of the web material with a wrap decreasing from the edges toward the center. The rolls are independently pivotable, on axes normal to their axes of rotation, to adjust their angles of cant relative to the length of the material, thereby to control their lateral pull. Detectors determine the count or spacing of the elements in regions near either edge, and may also compare the count or spacing of elements at the center of the material; alternatively, they may determine the positions of elements at either edge. The rolls are pivoted individually to adjust their cant angles as required to maintain desired spacings or relative lateral positions of the elongated elements.

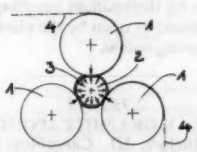


3,752,378

DEVICE FOR SUPPLYING STRIP-LIKE FABRIC BY MEANS OF ROLLERS

Bernd Scheffel, Weissenburg/Bay, Germany, assignor to Walter Scheffel, Weissenburg/Bay, Germany

Filed Dec. 21, 1971, Ser. No. 210,362
Claims priority, application Germany, Dec. 21, 1970, P 20 62 859.5
Int. Cl. B65h 17/22
U.S. Cl. 226—183 8 Claims



A device for guiding strip-like fabrics such as warp threads in looms provided with rigid rollers, at least one of which is driven, the rigid rollers being spaced around a flexible roller which presses against the rigid rollers, with the flexible roller, for example, being a fluid-filled tube.

3,752,379

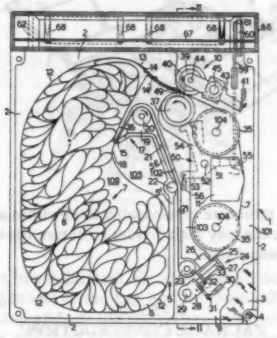
INTERCHANGEABLE ENDLESS LOOP MAGNETIC TAPE CARTRIDGES

Sergio Di Padova, and Pietro Musso, both of Ivrea, Italy, assignors to Ing. C. Olivetti & C., S.p.A., Turin, Italy

Filed Feb. 15, 1972, Ser. No. 226,444
Claims priority, application Italy, Feb. 16, 1971, 67513 A/71
Int. Cl. B65h 17/42
U.S. Cl. 226—119 2 Claims

An interchangeable endless loop magnetic tape cartridge is provided with a first compartment for storing the bulk of the tape and a second compartment containing the driving means and magnetic head. The first compartment is provided with a curved inner surface to reduce the amount of tape rubbing against the walls of the first compartment. Access to the second compartment is provided by a finger which protrudes

into the center of the second compartment which reduces the tendency of the tape to become electrostatically attracted to adjacent convolutions and to the walls and thus reduce tape tension between the driving means and tape head.

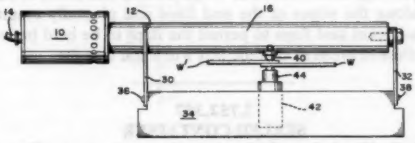


The tape driving means include pinch rollers which extend beyond the width of the magnetic tape for improving the frictional contact therebetween.

3,752,380
VIBRATORY WELDING APPARATUS

Andrew Shoh, Ridgefield, Conn., assignor to Branson Instruments, Incorporated, Stamford, Conn.

Filed Mar. 13, 1972, Ser. No. 234,198
Int. Cl. B23k *1/06*
U.S. Cl. 228—1 **14 Claims**



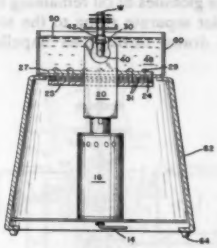
A vibratory welding apparatus specifically adapted for welding metal includes a resonator one wavelength long at the frequency of the sound transmitted therethrough and is supported from a stationary support by a set of support members which engage the resonator at two of its antinodal regions of longitudinal motion. The members are designed to yield in the direction of resonator motion but to provide rigidity in the direction normal to such motion.

3,752,381
ULTRASONIC SOLDERING APPARATUS

James J. Watson, Jr., Bethel, Conn., assignor to Branson Instruments, Incorporated, Stamford, Conn.

Filed Mar. 17, 1972, Ser. No. 235,602
Int. Cl. B23k *1/06*
U.S. Cl. 228—1 **8 Claims**

An ultrasonically activated molten metal bath is constructed for providing joints between the return bends of radiators. The ultrasonic apparatus includes an electroacoustic converter fitted with a bifurcated horn which extends

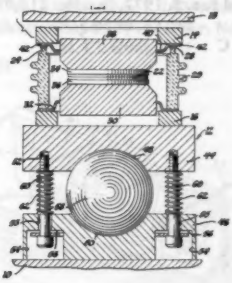


through the bottom of the tank holding a quantity of molten metal.

3,752,382
APPARATUS FOR WELDING A COVER TO A TUBULAR CERAMIC HOUSING

Thomas J. Furnival, Logansport, Ind., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 60,261, Aug. 3, 1970, Pat. No. 3,686,540.
This application Mar. 27, 1972, Ser. No. 238,354
Int. Cl. B23k *21/00*
U.S. Cl. 228—3 **2 Claims**



A hermetically sealed enclosure for a semiconductor device and a method and apparatus for making same is disclosed. A tubular ceramic housing is provided with an integral die on one end. A cold weldable layer is brazed on the integral die. A first cover member is brazed onto the other end providing a hermetic seal there. A second cover member is cold welded to the layer hermetically sealing the one end. The cold welding apparatus includes a pressure equalizing assembly having a pair of spaced resiliently coupled elements with facing hemispherical recesses. One of the elements slides on a bearing ball nested within the recesses to equalize the compressive forces of the cold welding around the end of the housing.

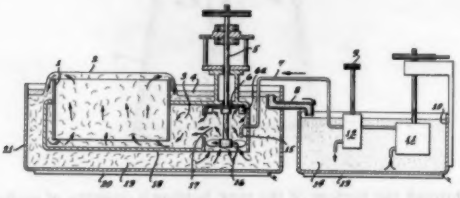
3,752,383
SOLDERING APPARATUS

Melvin K. Allen, Los Angeles, and H. Peter Eschenbrucher, Diamond Bar, both of Calif., assignors to Technical Devices Company, Cleveland, Ohio

Filed Nov. 11, 1971, Ser. No. 197,990
Int. Cl. B23k *1/08*
U.S. Cl. 228—37 **4 Claims**

Homogenization of petroleum oil in molten solder is produced in stages in an agitation chamber formed about the outlet of a solder pump of a standing wave soldering machine. In the first stage, a high pressure stream of oil is directed at the pressure faces of the pump propeller blades to produce inter-

mittent counteracting forces creating turbulence which reduces the oil to small particles and distributing them in the oppositely moving stream of molten solder. In the second stage, droplets or globules of oil remaining in the stream of oil and molten solder separate rising to the top of the agitation chamber to be drawn through an impeller agitator which



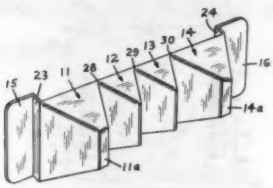
completes the reduction of the oil globules to finely divided particles which are distributed uniformly throughout the surrounding molten solder by shearing action of the agitator. The homogenized mixture of oil and molten solder flows into a pressure tank of the soldering machine to produce a standing wave of solder at a duct orifice.

3,752,384

RESILIENT PACKAGING SPACER

Gene E. Siburn, Newburgh, N.Y., assignor to International Paper Company, New York, N.Y.

Filed Jan. 5, 1972, Ser. No. 215,591
Int. Cl. B65d *5/50*
U.S. Cl. 229—14 C **14 Claims**



A resilient packaging spacer is provided comprising a plurality of flexible joined triangular or wedge-shaped elements, positioned in the same plane, said spacer being equipped with flexible insert means for attaching the spacer through a slit in a carton, such as a paperboard container. The resilient packaging spacer is intended to space cylindrical rectangular or square-shaped articles, such as a water heater, etc., in a container. For packaging cylindrical articles, the intermediate wedge-shaped elements are shorter than the exterior or terminal elements.

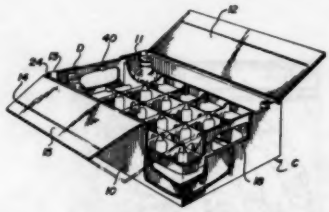
3,752,385

CARRIER FOR BOTTLES AND THE LIKE AND DIVIDER STRUCTURE THEREFOR

Richard E. Woodgate, London, Ontario, Canada, assignor to Labatt Breweries of Canada Limited, London, Ontario, Canada

Filed Feb. 9, 1972, Ser. No. 224,776
Int. Cl. B65d *3/24*, *5/50*
U.S. Cl. 229—15 **12 Claims**

A carrier for bottles and the like is described which has an improved divider structure. This divider structure is molded of a stiff plastics material and comprises a horizontal grid of longitudinal and lateral members integral with each other at regular points of intersection to form bottle-receiving compartments therebetween. A peripheral reinforcing strip surrounds the grid and is integrally joined to the ends of the longitudinal and lateral members. Bottle separating members are also integrally joined to and extend vertically downward from the longitudinal and lateral members between the intersections.



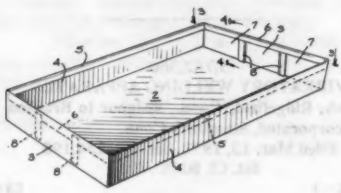
The divider structure is releasably held within a paperboard tray and in use the tray with divider structure fits within an enclosing paperboard shell.

3,752,386

PACKAGE CONSTRUCTION

Rudolph A. Froehlig, College Point, N.Y., assignor to Modern Album and Finishing Co., Inc., College Point, N.Y.

Filed Sept. 15, 1971, Ser. No. 180,694
Int. Cl. B65d *5/26*
U.S. Cl. 229—32 **8 Claims**



A package construction in which a blank has zones of adhesive along the edges of the end flaps and pivotally mounted tabs adjacent said flaps to permit the flaps to be held between the adhesive areas so that the box will stand upright.

3,752,387

SEALED CONTAINER

Horst F. W. Arfert, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Division of Ser. No. 49,492, June 24, 1970, which is a continuation-in-part of Ser. No. 854,108, Aug. 29, 1969, abandoned.
This application July 14, 1972, Ser. No. 272,059
Int. Cl. B65d *5/64*, *43/00*
U.S. Cl. 229—43 **8 Claims**

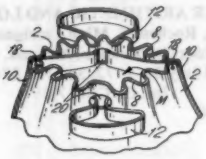
A closure having a peripheral flange portion provided with an annular bottom surface is sealed by the application of heat and pressure to a dish-like container having a peripheral flange portion provided with a cooperating annular top surface so as to define a high quality bonded lamination comprised of the flange portions. The outer portion of the lamination is then curled to form a high strength annular bead which defines the peripheral outline of the side wall of a sealed container.

3,752,388

PLASTIC BAG WITH INTEGRAL STRAP HANDLES

Albert A. Lynch, Rexdale, Ontario, Canada, assignor to Acme Paper Products Company Limited, Toronto, Ontario, Canada

Filed Dec. 2, 1971, Ser. No. 204,256
Int. Cl. B65d *33/10*
U.S. Cl. 229—54 R 4 Claims



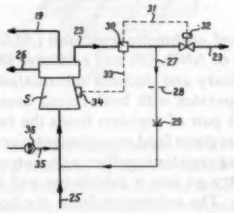
The instant bag is formed of two panels joined together by their side edges and at the bag bottom. Normally sandwiched between the top ends of the panels are a pair of straps which are integrally attached to the bag at and adjacent to its said side edges being otherwise detached from the panels to render them withdrawable from the bag mouth for use as handles.

3,752,389

CENTRIFUGAL SEPARATOR WITH CONTROL MEANS

Vilgot Raymond Nilsson, Hagersten, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed Dec. 3, 1971, Ser. No. 204,529
Claims priority, application Sweden, Dec. 7, 1970, 16515/70
Int. Cl. B04b *11/00*
U.S. Cl. 233—20 R 12 Claims



The rotor has a central outlet for a separated light liquid component, an intermittently opened peripheral outlet for separated sediment, and a third outlet for a separated heavy liquid component, there being a passage for conducting liquid from the third outlet to a reception place for heavy liquid component. Means are provided for controlling liquid flow to this reception place through said passage, and further means are provided for sensing when separated heavy liquid component is at a predetermined level in the rotor, said last means being operable upon such sensing to actuate the controlling means to effect liquid flow to the reception place through said passage.

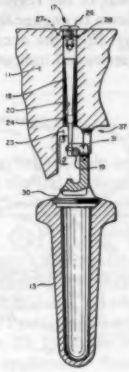
3,752,390

SWINGING BUCKET ROTOR ASSEMBLY

Steven J. Chulay, Los Altos, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Apr. 4, 1972, Ser. No. 240,968
Int. Cl. B04b *9/12*
U.S. Cl. 233—26 9 Claims

A swinging bucket centrifuge rotor having a plurality of machined bucket receiving cavities with a hanger disposed in each cavity. The cavity includes surfaces which guide a bucket cap hook to facilitate engagement of the hanger by the hook



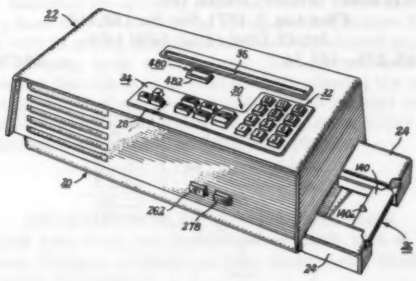
to support the bucket in the cavity and further guide the bucket as it swings.

3,752,391

PUNCH AND PRINT DATA CARD RECORDER

George Hamlin Leonard, and Raymond J. Enyeart, both of Varifab Inc. 1700 E. Putnam Ave., Greenwich, Conn.

Division of Ser. No. 33,800, May 1, 1970, Pat. No. 3,682,093.
This application Sept. 13, 1971, Ser. No. 180,045
Int. Cl. G06k *1/02*
U.S. Cl. 234—51 3 Claims



The disclosed data recorder includes a control cam operating to impart oscillating motions to separate punch and print actuators. The punch actuator reciprocates a punch bail to depress individual punches selected by data entry solenoids through punch interposers, thereby to perforate a data card. A step cam oscillated by the print actuator operates against print interposers coupled to the solenoids to angularly orient a print wheel, thus to imprint on the data card the data characters punched into the card. The data card is carried by a tray which is indexed through successive data entry positions in coordination with the control cam by tray stepping control apparatus. A replaceable ink cartridge supplies ink to the print wheel.

3,752,392

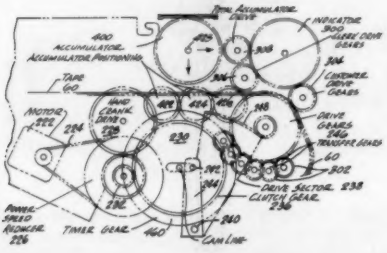
BUSINESS MACHINES

Kenneth F. Oldenburg, Arcadia, Calif., assignor to Litton Business Systems, Inc., New York, N.Y.

Division of Ser. No. 50,064, June 26, 1970. This application Jan. 6, 1972, Ser. No. 215,876
Int. Cl. G07g *1/00*
U.S. Cl. 235—7 R 5 Claims

A cash register is provided with a flexible plastic digit tape to interconnect the cash register display with the selected

depressed digit keys. The plastic digit tapes are very flexible and lightweight, and are operated to transmit force under tension to avoid binding and frictional forces. The digit tape is deflected down at the rear of the register to save space. The accumulator is moved down to engage the tape and to the rear to transfer to the display. Both the accumulator and the display assemblies have interleaved indicator wheels having different indications, with the wheel spacing and movement being unitarily related to the keyboard spacing. A combined ADD and TOTAL control, operating upon a cam-cam follower assembly is used to initiate the two modes of operation of the cash register to perform ADD cycles and TOTAL cycles of operation. Light duty components and simple controls, compatible with the low inertia of the digit tapes are used throughout the cash register.



3,752,393

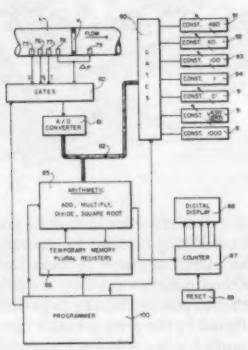
DIGITAL FLOW CALCULATOR

L. Max Moseley, Dallas, Tex., assignor to Teledyne Industries, Inc. (Geotech Division), Dallas, Tex.

Filed Aug. 2, 1971, Ser. No. 168,110

Int. Cl. G06f *15/32*; G01f *1/00*

U.S. Cl. 235—151.34 **10 Claims**



A pre-programmed calculator illustrated by an embodiment which repeatedly solves expressions for determining the gas flow through an orifice in a pipeline, the calculator performing its calculations using digital techniques, and the measured flow parameters, including in this example the gas temperature, pressure, specific gravity and differential pressure across the orifice, all being changed to digital form prior to such calculations. Numerical constants used in the expressions being solved are inserted into the calculator in digital form by manually presettable switches. The gas flow calculated in standard cubic feet is subsequently converted to thousands of standard cubic feet and cumulatively displayed, and the remainder after each such conversion is added to the next calculated flow value prior to its conversion so that each remainder is preserved. The expression for gas flow which is solved by the present calculator is corrected by including a supercompressibility factor which is calculated anew during each new solution of the flow expression, and all calculations are repeated at a high rate to achieve high accuracy.

3,752,394

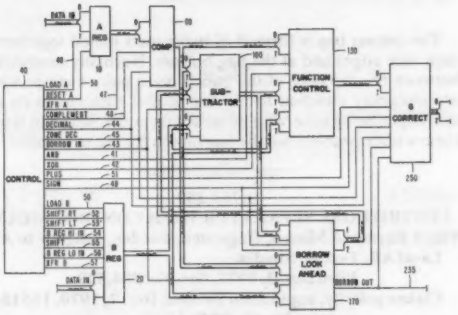
MODULAR ARITHMETIC AND LOGIC UNIT

John Joseph Igel, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 31, 1972, Ser. No. 276,339

Int. Cl. G06f *7/50*

U.S. Cl. 235—174 **17 Claims**



A modular and arithmetic logic unit (ALU) for performing logic functions of AND, OR and exclusive OR and arithmetic functions of binary and decimal subtract/add where decimal subtract/add operates with both zoned decimal and decimal data formats. A pair of registers holds the two operands. The outputs of one register feed complement circuitry and the outputs of the other register together with outputs from the complement circuitry go into a subtractor and into borrow look ahead circuitry. The subtractor feeds the borrow look ahead circuitry and function control logic. The outputs from the borrow look ahead circuitry are sent back into the subtractor and one of the outputs is borrow out. The data outputs are taken from a six correct circuit having inputs from the function control logic. Control signals appropriately control the operation of the complement circuit, subtractor, borrow look ahead circuit, function control logic and the six correct circuit.

ERRATUM

For Class 236—47 see:
Patent No. 3,753,184

3,752,395

WIND MOTOR OPERATED HEATING SYSTEM

Baruir Ashikian, 505 Frechette, Sherbrooke, Quebec, Canada

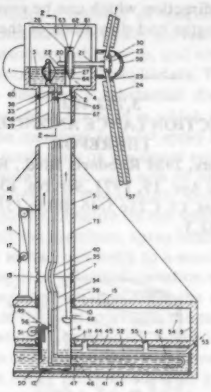
Filed June 28, 1971, Ser. No. 157,428

Int. Cl. F24d *5/02, 12/00*

U.S. Cl. 237—46 **1 Claim**

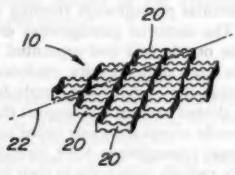
A wind motor supplies mechanical energy to operate a

mechanohydrothermal energy conversion system, the result-



ing heat being stored in a liquid and used as needed.

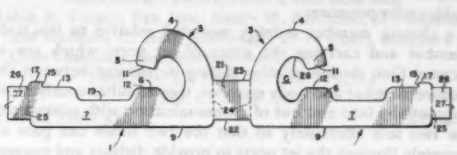
3,752,396
TRACTION MAT
Leopold Bustin, P. O. Box 589, Dover, N.J.
Filed July 16, 1971, Ser. No. 163,370
Int. Cl. E01b *23/00*; E04f *15/06*
U.S. Cl. 238—14 2 Claims



A traction mat for positioning between a driving wheel of a motor vehicle and a roadway or the like which is covered with ice, so as to provide friction between the wheel of the motor vehicle and the roadway, is disclosed to comprise a plurality of generally longitudinally extending strips having a plurality of bends formed in each longitudinally extending strip, each strip extending generally longitudinally and including a plurality of spaced direction-reversing bends as well as a plurality of intermediate bends disposed between adjacent direction-reversing bends, the longitudinally extending strips being transversely spaced and longitudinally positioned such that the outside surface of each strip along its direction-reversing bends is in contact with the outside surface of the next adjacent strips along the direction-reversing bends, means for securing the adjacent longitudinally extending strips at their direction-reversing bends and a plurality of longitudinally spaced prongs formed on the upper and lower surfaces of each longitudinally extending strip to define friction elements for providing non-slip engagement between the ice of the roadway and the traction mat as well as between the wheel of the motor vehicle and the mat.

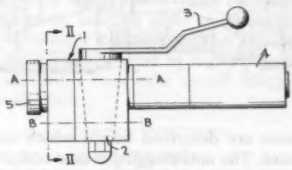
3,752,397
RAIL ANCHOR
Emerson J. Ruble, Hinsdale, Ill., assignor to Portec, Inc., Oak Brook, Ill.
Filed Nov. 23, 1971, Ser. No. 201,368
Int. Cl. E01b *13/02*
U.S. Cl. 238—327 9 Claims

A rail anchor of the twin-jaw hook type is formed from sheet stock and includes a pair of planar side plates disposed



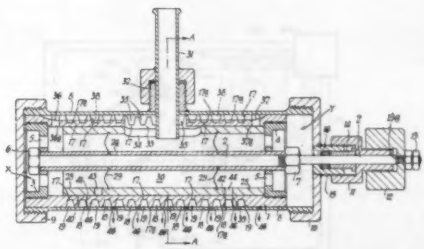
in parallel spaced apart relationship and joined to one another by connecting webs at the end portions thereof.

3,752,398
METHOD FOR SIMULTANEOUS FLUSH CLEANING MIXING CHAMBER
Sven Rolf Svensson, Goteborg, Sweden, assignor to Svenska Aktiebolaget Plastic Protection, Goteborg, Sweden
Filed Apr. 23, 1971, Ser. No. 136,666
Claims priority, application Sweden, Apr. 27, 1970, 5836/70
Int. Cl. B05b *15/02*; B08b *7/04*
U.S. Cl. 239—1 2 Claims



In machines for spraying plastics, there is a risk that the spray head may be blocked by curing plastics mixture if the head with its mixing chamber is not carefully cleaned as soon as a spraying cycle is completed. The present invention eliminates this risk by a method for flush cleaning the spray head by means of a cleaning liquid which is injected in the head, said injection being controlled by means of valves also controlling the mixing and spraying of the plastics.

3,752,399
APPARATUS FOR TREATING HUMAN HAIR
Michael John Neale, and Henry Edward Gotch, both of Herriard, England, assignors to Rene Andre Louis Moulard, London, England
Division of Ser. No. 68,452, Aug. 31, 1970, Pat. No. 3,701,475.
This application May 15, 1972, Ser. No. 253,645
Int. Cl. B05b *1/14*
U.S. Cl. 239—101 10 Claims



Means for controlling the outflow of two fluids having different physical and/or chemical characteristics, particularly hot and cold water for the treatment of hair, to provide discrete sprays of said fluids from an array of jet ports, which includes

a body member having two sets of fluid passages which are adapted to communicate respectively with sources of the two fluids under pressure;

a closure member slidably mounted relative to the body member and carrying the array of jet ports which are so located that, during relative sliding movement between the closure member and body member, they simultaneously move sequentially into and out of communication with passages of the two sets alternately so that the two fluids can pass alternately through the jet ports to provide distinct and sequential impulses of the two fluids alternately.

3,752,400

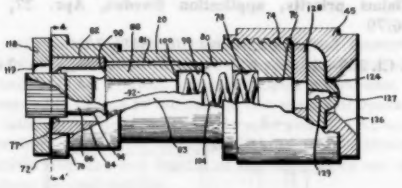
COMBINED SPRAY AND ANTI-CLOGGING MEANS

Oliver Jerome Calder, 1205 E. Madison, Orange, Calif.

Continuation-in-part of Ser. No. 39,621, May 22, 1970, Pat. No. 3,645,450. This application Oct. 4, 1971, Ser. No. 186,084

Int. Cl. B05h *15/02*

U.S. Cl. 239—116 **14 Claims**



Spray means are described herein which comprise anti-clogging means. The anti-clogging means comprises a device which is positioned upstream of the spray tip and which has a constricted orifice that surrounds a mandrel which has a fluted end that extends past the orifice entrance. The mandrel is slidably mounted in the orifice with a spring to bias it against movement by fluid pressure. Any solids in the liquid that would clog the spray tip are abraded by the action of the mandrel. In a preferred embodiment, the orifice and mandrel assembly is used with airless spray equipment to prevent clogging of the m1nute orifices employed in this equipment and several interchangeable assemblies are used in combination with the several different sizes of orifices used in this spray equipment.

3,752,401

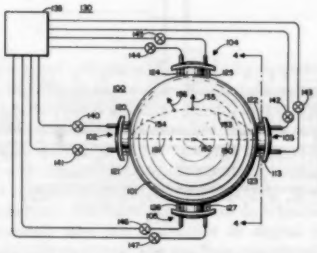
CONTROL APPARATUS

Apostolos P. Kizilos, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 23, 1968, Ser. No. 786,301

Int. Cl. B64c *15/04*

U.S. Cl. 239—265.35 **4 Claims**



A three-dimensional variable deflection thruster for varying the direction of a fluid stream about two mutually orthogonal axes, having no moving parts. A plurality of fluid streams are caused to attach to and flow around a convex three-dimensional surface to impinge on one another and form a resultant fluid stream. The resultant fluid stream departs from the convex surface in a direction which can be controlled by varying the relative strengths and directions of the component fluid streams.

3,752,402

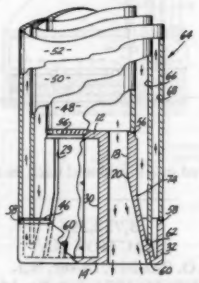
FLUID INJECTION LANCE AND NOZZLE MEANS THEREFOR

Harry Marioneaux, 2934 Rubdorix Blvd., Riverside, Calif.

Filed Apr. 19, 1971, Ser. No. 135,269

Int. Cl. C21c *5/46*; **B05b** *15/00*

U.S. Cl. 239—132.3 **10 Claims**



A nozzle attachable to a lance shank to provide an oxygen injection lance for the delivery of large quantities of oxygen to the melt in a steelmaking furnace. The nozzle is bell-shaped and has nine sectorial passageways running through it from top to bottom. The sectorial passageways are equiangularly spaced about the nozzle axis and separated by radial webs. Each of the webs has a slotted cavity, enclosed at the top and bottom, penetrating the body of the nozzle from the outside in, and all of the slotted cavities converge at the axial center of the nozzle to provide access from one to the other at this juncture. The sectorial passageways have straight-walled upper portions, but flare radially outwardly in their lower portions.

When the lance is in operation, oxygen passes downwardly through the lance shank and from there into the sectorial passageways of the nozzle. Because of their flaring lower portions, the sectorial passageways deliver the oxygen in an expanding pattern for widespread and uniform coverage of the melt in the furnace. Coolant is circulated through the slotted cavities in the radial webs of the nozzle when the injection lance is in use.

3,752,403

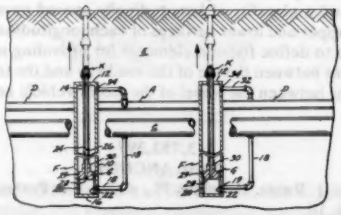
IRRIGATION SYSTEM

Anthony Van Diest, 15305 Oliva Ave., Paramount, Calif.

Filed June 27, 1972, Ser. No. 266,700

Int. Cl. B05b *15/10*, *15/00*

U.S. Cl. 239—204 **6 Claims**



An irrigation system that is connected to a source of water under pressure, and is buried in a field at a depth that is below the maximum depth to which the field will be plowed, and

below the frost line if the installation is made in an area subject to severe winters.

The system includes a number of spaced, vertically positioned cylinders that have vertically movable elongate members operatively associated therewith, and which members are substantially retractable into the cylinders. The upper ends of the cylinders are disposed a substantial distance below the maximum depth to which the field in which they are installed will be plowed. The members support spray heads and sets of pivotally movable protectors on the upper ends thereof.

The members, spray heads and sets of protectors may be forced either upwardly or downwardly through the ground defining the field by the pressure on the water used for irrigation purposes. After the members, spray heads and sets of protectors have been moved upwardly to a maximum extent, the spray heads are disposed a desired elevation above the surface of the field, and water discharges from the spray heads onto the upper surface of the field to irrigate the same.

When the irrigation is completed, water is discharged into the upper portions of the cylinders, with concurrent discharge of water from the lower portions thereof, and the members, spray heads and protectors being forced downwardly through the ground until the spray heads are adjacently disposed to the upper ends of the cylinders. The sets of protectors are of such shape that as they move upwardly and downwardly through the ground the force exerted by the ground on these protectors maintains the latter in an encircling position about the spray heads to prevent damage being done thereto, as well as earth and debris being forced into the spray heads to clog the same.

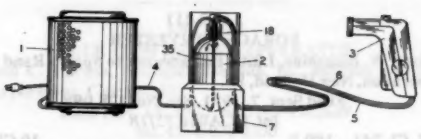
When the members, spray heads and sets of protectors are in the retracted positions beneath the ground surface, plowing and cultivating of the field in which they are installed may be carried out without danger of the irrigation system being damaged as a result thereof.

3,752,404

COMPRESSED AIR SPRAY APPARATUS

John R. Forsberg, Arlington Heights, Ill., assignor to Helene Curtis Industries, Inc., Chicago, Ill.

Filed Nov. 8, 1971, Ser. No. 196,623
Int. Cl. B05b 7/32
U.S. Cl. 239—308 **8 Claims**



A hair spray system employing air under pressure to propel and atomize hair spray liquid comprises a constant pressure compressor, a liquid reservoir supplied with air from the compressor and in turn supplying air and liquid to a spray gun. Multiple reservoir and guns can be connected to one compressor. The gun includes a mixing chamber floating between spring biased valves at the chamber ends with an intermediate air inlet and an end liquid inlet, the forward spring being weaker. The gun trigger pushes the rear valve thereby causing the weaker forward spring to first open and start the air flow through the forward valve, after which the rear valve opens and liquid flow starts. On cut off, the liquid flow stops before the air flow stops. An adjustable stop controls the trigger movement to vary the ratio of liquid flow to air.

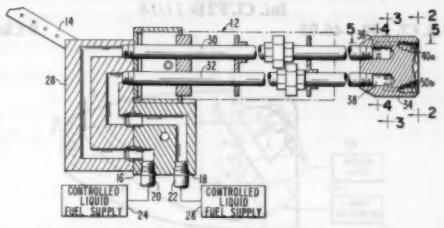
The compressor is housed in an air filter housing, and the reservoir for hair spray liquid is located in a housing with an arrangement to pinch the air hose to stop flow when the housing for the reservoir is opened. The liquid reservoir involves a novel arrangement for connecting the compressor and spray gun to a replacement reservoir unit.

3,752,405

VARIABLE FLAME SHAPE OIL BURNER

Ralph R. Vosper, San Jose; Harry W. Kirchner, Jr., Belmont, and Guilford C. Hull, Sunnyvale, all of Calif., assignors to Coen Company, Inc., Burlingame, Calif.

Filed Nov. 27, 1968, Ser. No. 779,333
Int. Cl. B05b 7/00
U.S. Cl. 239—413 **3 Claims**



An oil burner having two separate, individually fed oil injection systems, one of which injects one or more narrow, axially directed oil streams, and the other of which injects one or more short, wide-angle oil streams. The apparatus is so arranged that the streams injected by the two systems intersect one another to form a composite stream which combusts to form a composite flame.

3,752,406

CONTAINERS FOR CHEMICAL LIGHT SOLUTIONS

Philip Auguste McDermott, Upper Saddle River, and Andrew Milo Semsel, Sommerville, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sept. 17, 1971, Ser. No. 181,630
Int. Cl. F21v 9/16
U.S. Cl. 240—2.25 **6 Claims**

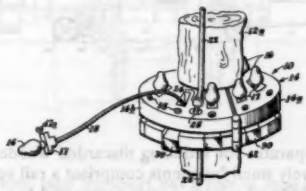
New enclosure material for chemiluminescent light devices which has reduced effect on the chemiluminescent reactants and results in improved storage characteristics for the devices.

3,752,407

CHRISTMAS TREE ORNAMENT AND DECORATION DEVICE

Ronald K. Baugh, 7275 Rosewell Rd. N.E., Apt. 322, Atlanta, Ga., and James E. Beeler, 6277 Commonwealth Ct., Indianapolis, Ind.

Filed Oct. 6, 1971, Ser. No. 186,917
Int. Cl. A47g 33/16
U.S. Cl. 240—10 T **1 Claim**



An electric light ornament and decoration device for Christmas trees, in which a plurality of electric light bulbs are provided in a cluster or group on a body member, which is adapted to be installed interiorly of the tree, and with retractable cords for energizing the individual bulbs from the body

member which itself is energized from an associated electric source.

3,752,408

LIGHTING DEVICES WITH AUTOMATIC REGULATION

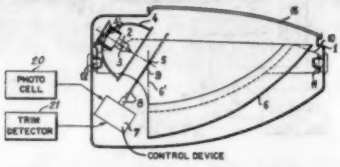
Michel Tixier, Billancourt (Hauts de Seine), France, assignor to Regie Nationale Des Usines Renault, Billancourt (Hauts de Seine) and Automobiles Peugeot, Paris, France

Filed Nov. 9, 1970, Ser. No. 87,739

Claims priority, application France, Nov. 21, 1969, 6940150

Int. Cl. F21v *11/18*

U.S. Cl. 240—46.05 **9 Claims**



This lighting device for automotive vehicle, adjustable by means of a control system, comprises a filament bulb located at a first focus of an elliptic mirror of revolution four of which the second focus is coincident with the focus of one fraction of a parabolic mirror of revolution disposed on one side only of a plane containing the axis of revolution of said parabolic mirror, which forms substantially a half right angle with the axis of the elliptic mirror, at least one masking element being so controlled by an actuator responsive to said control system that, being interposed substantially in said second focus, it can reduce the surface area of the real image of said filament, this device applying more particularly to automotive headlamps.

3,752,409

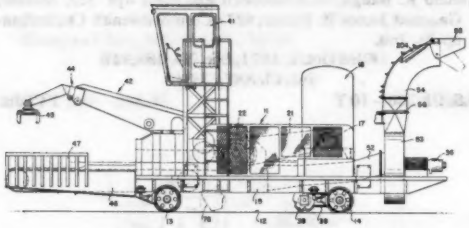
WOODEN ARTICLE AND LIKE DESTROYER

Herbert H. Lewis, Jacksonville, Fla., assignor to Jacksonville Blow Pipe Company, Jacksonville, Fla.

Filed Sept. 30, 1971, Ser. No. 185,247

Int. Cl. B02c *13/06, 18/06, 21/02*

U.S. Cl. 241—60 **10 Claims**



Mobile apparatus for reducing discarded wooden railroad ties to relatively small fragments comprises a rail vehicle having a set of drive wheels, an engine connected to a two speed drive system for the wheels, a cutting and punching mechanism driven from the engine through a clutch, an interlock for disengaging the clutch when the vehicle is driven in the higher speed range, a conveyor for advancing ties to be reduced into the cutting mechanism, a crane for picking up ties to be reduced and depositing them on the conveyor, and a blower for discharging fragments from the cutting mechanism.

3,752,410

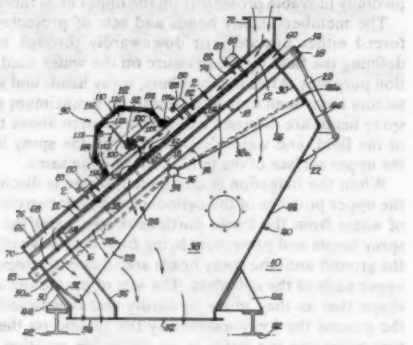
APPARATUS FOR SIZING PARTICULATE MATERIAL

Henry W. Dienst, Geneva, and Leslie D. Rikker, Oak Forest, both of Ill., assignors to National Engineering Company, Chicago, Ill.

Filed July 19, 1971, Ser. No. 163,749

Int. Cl. B02c *13/284*

U.S. Cl. 241—69 **17 Claims**



Apparatus for sizing particulate material comprising an inclined screen mesh for receiving material adjacent the upper end to flow toward the lower end and means for vibrating said mesh to sift on-size particles therethrough. Lump breaker means is provided intermediate the upper and lower ends of the screen for impact breakage of agglomerated oversize lumps of said particulate material and for retarding the downward travel of said oversize material. Said lump breaker includes at least one rotating paddle extending transversely across said screen mesh and formed of flexible material, and a breaker plate above the screen mesh for protecting the screen and cooperating with the paddle to help break up large lumps of material into smaller size. The paddle is rotated in a direction to impact the oversize lumps upwardly on said screen mesh counter to the general flow direction of material downwardly toward the lower end.

3,752,411

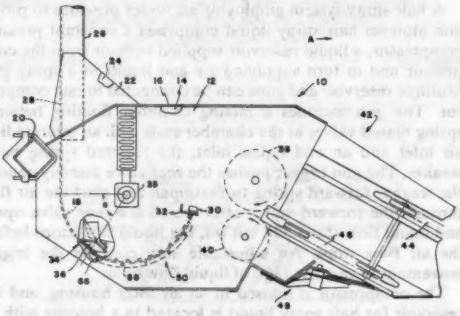
FORAGE HARVESTER

Allison W. Blanshine, Lititz, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Sept. 7, 1971, Ser. No. 178,098

Int. Cl. A01d *55/18*

U.S. Cl. 241—189 R **10 Claims**



A forage harvester of the type having a cylindrical type cutterhead rotatively mounted in the frame. A curved crop con-

fining member is mounted within the frame and is closely spaced to the cutterhead, the curved member being provided with a plurality of bars which extend generally parallel to the axis of rotation of the cutterhead and cooperate with the knives of the cutterhead to cut and/or abrade any grain which passes between the cutterhead and the curved member.

3,752,412

WINDING OF CONTINUOUS WEBS ON TO REELS

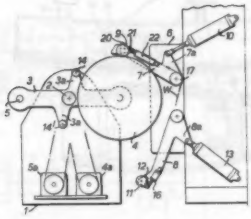
Graham Archie Bruce Byrt, Bristol, England, assignor to Masson Scott Thrissell Engineering Limited, Bristol, England

Filed Feb. 7, 1972, Ser. No. 224,133

Claims priority, application Great Britain, Feb. 5, 1971, 4,044/71

Int. Cl. B65h *19/26, 19/28*

U.S. Cl. 242—56 A 5 Claims



Apparatus for transferring a continuous web of sheet material being wound onto a reel to a fresh core employs a rider roll to press the web as it is being wound and a guide roll for the web during transfer. Conveniently the reel and core are on a turnover stand and during transfer, when the reel is moved away from the rider roll, the guide roll is engaged with the web between rider roll and reel to avoid too long an unsupported run. It is also used to assist in wrapping the web around the new core and a web cutter is mounted in close association therewith. The sequence of movements of reel, core, rolls and cutter can be automatically controlled.

3,752,413

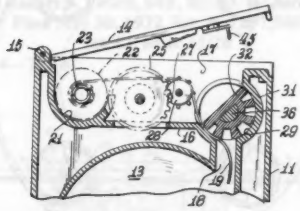
BULK FILM REWIND APPARATUS

Jerome C. Caruso, Arlington Heights, Ill., assignor to Leira Corporation, Chicago, Ill.

Filed Nov. 15, 1971, Ser. No. 198,639

Int. Cl. G03b *1/00*

U.S. Cl. 242—71.7 8 Claims



A bulk film rewind apparatus including a light gate structure wherein the light gate is coordinated with the apparatus cover so as to lock said cover closed when the light gate is in open position.

3,752,414

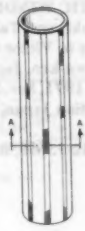
PLASTIC PIRN SLEEVE

Thomas Urquhart, Whitby, Ontario, Canada, assignor to Du-Pont of Canada Limited, Montreal, Canada

Filed Feb. 19, 1971, Ser. No. 117,013

Int. Cl. B65h *75/26, 75/10*

U.S. Cl. 242—118.32 1 Claim



A plastic pirn sleeve bearing rows of circumferential fine grooves having flush ends to prevent filament entangling. A process and apparatus useful for making such sleeves are disclosed for indenting the external surface of a thermoplastic tube by heating the external surface of the tube above its softening point, rolling at least three die wheels each in a separate path along the length of the surface of the tube while the tube is supported on a mandrel and at the same time pressing the die wheels against the surface of the tube to form permanent indentations therein.

3,752,415

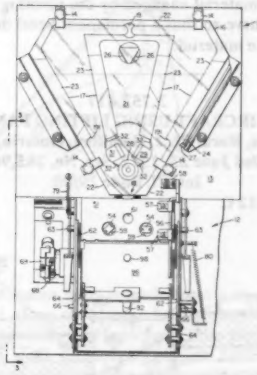
MAGNETIC TAPE TRANSPORT

Roger R. Sleger, San Carlos, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Jan. 18, 1971, Ser. No. 107,066

Int. Cl. G11b *15/58, 23/10;* B65h *19/02*

U.S. Cl. 242—184 18 Claims



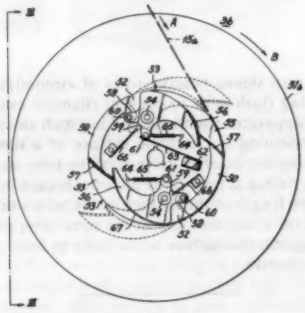
A magnetic tape transport has a pair of tape loop vacuum columns on either side of a capstan and a pair of flanking heads, and the columns are tapered so that with increasing loop length, an increasing cross sectional area of tape is exposed to vacuum, counteracting the drag of the heads, and no pinch roller is needed with the capstan. In fast wind mode, only one of the vacuum columns is used, and a single loop length sensing apparatus controls both reel motors, which are

biased such that the supply reel tries to make the loop longer than a desired mean length and the takeup reel tries to make the loop shorter than the mean, resulting in use of the reel motors at fullest capacity without danger of loss of control. An automatic cassette loader is also provided togetber with circuitry adapting the apparatus for automatic high speed recording of cassettes.

3,752,416
AUTOMATIC WINDING REEL

Shichiro Fukatsu, Chigasaki, and Takeshi Okano, Yokohama, both of Japan, assignors to Victor Company of Japan, Ltd., Yokhama-City, Kanagawa-ken, Japan

Filed Apr. 5, 1971, Ser. No. 131,033
Claims priority, application Japan, Apr. 3, 1970, 45/31555; Apr. 3, 1970, 45/31556
Int. Cl. G11b *15/66*; B65h *75/28*
U.S. Cl. 242—195 **8 Claims**

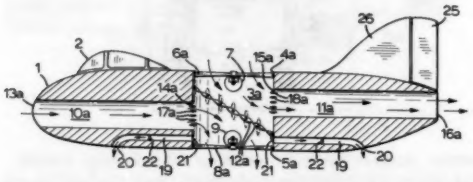


An automatic winding reel comprises a pivoting pawl mounted on a reel hub to be projected from and retracted into the reel hub. The pivoting pawl comprises a first pawl part for engaging a tape-like material and a second pawl part for guiding the tape-like material, engaged by said first pawl part, to the outer peripheral surface of the reel hub along the outer surface of the second pawl part in a smooth gradual curve. The tape-like material engaged by the pivoting pawl is wound in a gradual curve so that a permanent bend does not remain on the tape-like material.

3,752,417
AIRCRAFT USING LIFTING FANS

Prejean Lagace, Rural Rt. 2, Hamilton, Ontario, Canada

Filed June 23, 1972, Ser. No. 265,903
Int. Cl. B64c *29/00*
U.S. Cl. 244—12 C **7 Claims**

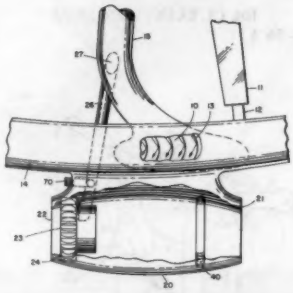


An aircraft of VTOL or STOL type is provided with at least one vertically extending duct in the fuselage containing an upper and a lower fan. Air valve means between the fans divide the duct into upper and lower regions and control the air from the upper fan to flow downward and/or into a duct extending rearwardly from the upper region. Other air valve means control the flow of air from a front duct into the lower region.

3,752,418
ANTI-TORQUE SYSTEM FOR TIP DRIVEN ROTOR BLADES

William N. Rosta, Fort Worth, Tex., assignor to The VLM Corporation, Fort Worth, Tex.

Filed May 12, 1972, Ser. No. 252,623
Int. Cl. B64c *29/00*
U.S. Cl. 244—23 C **8 Claims**

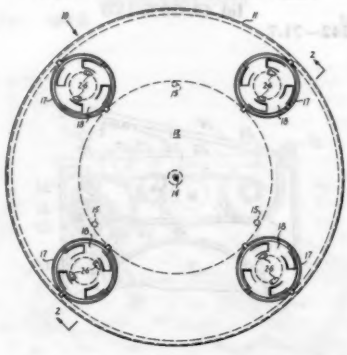


Disclosed ia an anti-torque and yaw control system for rotary wing aircraft employing tip driven rotor blades. The rotor blades are driven by a turbine drive ring powered by high velocity fluid. The drive ring is enclosed in a shroud and fluid passing through the turbine ring is collected in a ducted fan axially alligned tangentially with the dirve ring. The ducted fan is also tip driven by fluid from the main drive fluid supply. Alternative arrangements for varying the thrust of the ducted fan are shown. A jet thruster cooperating with the drive system is used for yaw control.

3,752,419
AIRCRAFT

Stanley H. Richter, 2327 S. Rio Grande Ave., Orlando, Fla.

Filed July 29, 1971, Ser. No. 167,165
Int. Cl. B64c *29/04*
U.S. Cl. 244—23 C **5 Claims**



An aircraft including a body having a number of rotary lift elements mounted for rotation therein. Each of the lift elements is arranged with a vertical axis and is rotated by jet en-

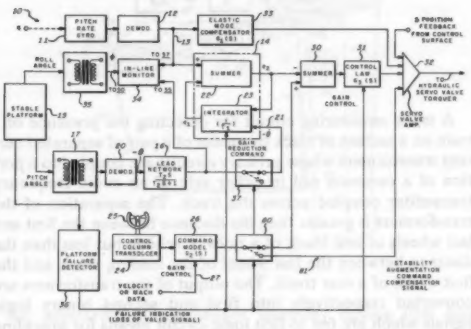
gines mounted near the periphery thereof. A plurality of paddle wheel lift members driven by air impinging thereagainst are mounted in chutes extending from the bottom to the top of the lift members. The blades of the paddle wheel ride on a rooster tail of air from the bottom chute to create lift. A flow of air above the center line of the paddle moves in against the top of the blades above the center line to also create lift and to cause the rotation of the blades. The top side of the bottom chute creates vacuum for lift and allows bottom spiral blade to turn freely until it passes center line for additional lift power.

3,752,420

AUGMENTED WASHOUT CIRCUIT FOR USE IN AUTOMATIC PILOTS

Stephen S. Osder, Scottsdale, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 4, 1971, Ser. No. 103,554
Int. Cl. B64c *13/18*
U.S. Cl. 244—77 D **14 Claims**



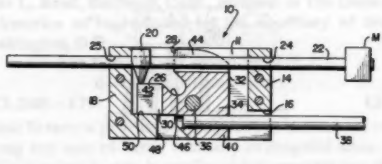
The invention is used in automatic pilots for navigable craft and comprises a washout circuit responsive to the signals from a body mounted pitch rate sensor and to the pitch rate signals from a vertically referenced sensor. The washout circuit comprises an algebraic summation circuit with an integrator in shunt therewith. The signals from the body mounted sensor are applied to an input of the summation circuit and the signals from the vertically referenced sensor are applied to an input to the integrator in subtractive fashion. Thus, the washout circuit provides wide bandwidth pitch rate stabilizing signals while washing out the undesirable azimuth rate coupling component of the feedback signal from the body mounted pitch rate sensor.

3,752,421

LINEAR-PIVOTAL CONVERTER

William B. Harvey, 866 College Pky., Apt. 202, Rockville, Md., and Robert S. Violett, 64B, Rt. No. 1, Clarksburg, Md.

Filed May 30, 1972, Ser. No. 257,500
Int. Cl. B64c *25/26*
U.S. Cl. 244—102 SL **10 Claims**



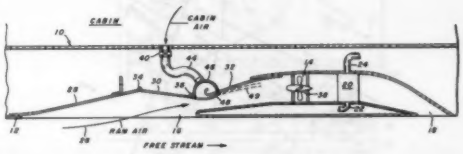
A device for converting reversible linear motion to reversible pivotal motion wherein the member undergoing pivotal motion is locked against motion at both limits thereof.

3,752,422

JET AUGMENTED RAM AIR SCOOP

Joe N. Runnels, Bellevue, Wash., and Svend Strandbygaard, North Glenn, Colo., assignors to The Boeing Company, Seattle, Wash.

Filed June 30, 1971, Ser. No. 158,282
Int. Cl. B64d *13/06*
U.S. Cl. 244—118 R **7 Claims**



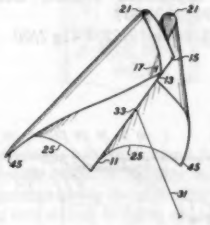
Ram air scoop system, particularly adapted for use in aircraft, wherein cabin air from the interior of the aircraft is fed as a high velocity jet into the scoop and passed through a heat exchanger for the cabin air-conditioning system. This has the effect of improving the aerodynamic efficiency of the scoop by increasing the velocity at the exit of the ram air system in flight, resulting in less drag. While the aircraft is on the ground and air is forced through the scoop by a fan or the like, the cabin air can be at a temperature lower than that of the ambient air, this cooler cabin air acting to increase the efficiency of the heat exchanger.

3,752,423

LIFTING AND/OR ROTATING BODY CONSTITUTING A KITE

William Schaeffer, 67 Malling Dr., Rochester, N.Y.

Filed Jan. 31, 1972, Ser. No. 221,921
Int. Cl. B64c *31/06*
U.S. Cl. 244—153 R **4 Claims**

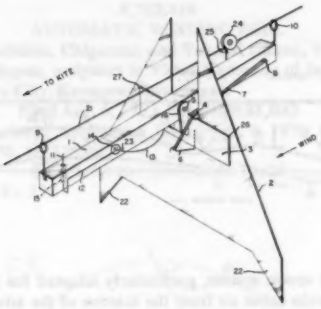


A small wind-borne body is made from a sheet of paper or the like folded along the center line to provide a keel, the sheet curving upwardly and outwardly from the keel, symmetrically on both sides thereof, to provide two wings. At the front end, the two wings are brought together and fastened to each other and to the central portion close to the keel. A single flying line is attached directly to the keel somewhat rearwardly of the front end. It is usually not necessary to use a bridle connected to the body at two or more points. No tail is used, in light and moderate winds. Preferably the body is made from a single sheet, but two separate sheets may be used, fastened together along the keel. With sufficient breeze, the body will lift light objects suspended from it, and also may be made to rotate somewhat, to provide an interesting and entertaining kite.

3,752,424
AUTOMATIC ACTION TOY GLIDER-KITE STRING FLYER

Willis R. Battles, 560 S. Helberta Ave., Redondo Beach, Calif.

Filed July 14, 1971, Ser. No. 162,529
Int. Cl. B64c 31/06
U.S. Cl. 244—155 R 6 Claims

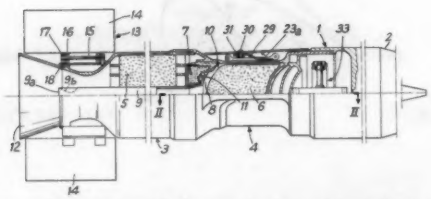


A folding wing toy glider is suspended from and rides up a kite string, propelled by the wind acting upon the vertical surface of the down-folded wing, until the glider strikes a stop, causing the wing to fold horizontally by momentum, assisted by a rubber band or spring tension. The fluer descends the kite string under the influence of gravity until it contacts a lower stop whereupon momentum snaps the wing back to its original vertical position, assisted by the rubber band after the wing has rotated about 40 degrees. The flyer then again starts up the kite string and this cycle is repeated automatically as long as desired.

3,752,425
SELF-PROPELLED NON-GUIDED MISSILES

Bernard Andre Henri Detalle, L'Haye-les-Roses, France, assignor to Societe Anonyme dite: Societe Europeene De Propulsion, Puteaux (Hauts-de-Sein), France

Filed Oct. 27, 1971, Ser. No. 193,093
Claims priority, application France, Oct. 28, 1970, 7038975; Sept. 3, 1971, 7132007
Int. Cl. F42b 13/32; F41g 7/00
U.S. Cl. 244—3.21 6 Claims

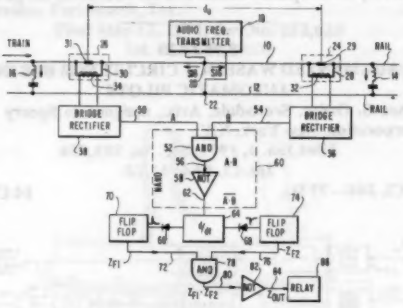


This invention relates to self-propelled non-guided missiles, of the type comprising a collapsible tail unit arranged on the external wall of the missile body close to the ejection nozzle for the propellant gases: a gyroscope is mounted in the missile body and has a shaft disposed in a plane perpendicular to the longitudinal axis of the missile, and a chamber to contain a suitable propellant fuel. In such a missile, the invention provides a lifting aerofoil that is secured to the external wall of the body and close to the plane containing the centre of gravity thereof; the gyroscope acts as a banking stabiliser to maintain a substantially constant attitude for the aerofoil and is mounted in a body which is locked by means of a locking member until the propellant fuel has been combusted.

3,752,426
TRAIN DETECTOR

Ajoy Kumar Pal, Downers Grove, Ill., assignor to Portec, Inc., Oak Brook, Ill.

Filed May 7, 1971, Ser. No. 141,270
Int. Cl. B61l 1/02
U.S. Cl. 246—249 9 Claims

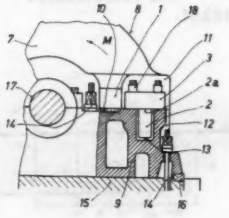


A track monitoring circuit for detecting the presence of a train on a section of track by means of a pair of separated current transformers whose primary circuits are coupled to a portion of a common rail in either side of an audio frequency transmitter coupled across the track. The separation of the transformers is greater than the distance between the first and last wheels of one truck of a railway vehicle but less than the distance between the last wheel of the leading truck and the first wheel of a rear truck. The output of the transformers are converted respectively into first and second binary logic signals which are fed to first logic circuit means for providing an output signal indicative of the NOT AND function. The output of the first NOT AND logic circuit means is fed into two flip-flop circuits through a differentiator. Each flip-flop is respectively triggered by opposite edges of the output pulse of the first NOT AND logic gate. The outputs of these flip-flops are fed to a second NOT AND logic circuit means for providing an output which is adapted to activate suitable utilization or indicating means.

3,752,427
SUPPORT ARRANGEMENT FOR A TURBOMACHINE

Hans Bellati, Wettingen, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed Mar. 7, 1972, Ser. No. 232,421
Claims priority, application Switzerland, Mar. 11, 1971, 3690/71
Int. Cl. F01d 1/00; F16f 15/00
U.S. Cl. 248—19 3 Claims



A support arrangement for a turbo-machine having its casing divided in a substantially horizontal plane into upper and lower parts on which are provided claw members having abut-

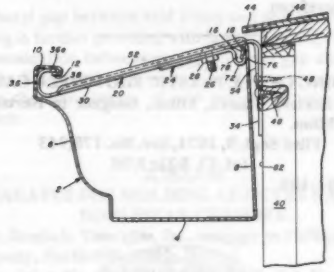
ment surfaces facing the divider plane. The claw members bear on casing supports anchored in the foundation, and tiltable discs biased by disphragm springs are interposed between the abutment surface of a claw on the lower casing part and a stressing bar rigidly mounted on the associated casing support.

3,752,428

GUTTER HANGER ASSEMBLY

John W. Trostle, Allison Park, and Norman L. Martin, Coraopolis, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed June 10, 1971, Ser. No. 151,807
Int. Cl. E04d *13/06*
U.S. Cl. 248—48.2 **15 Claims**



An adjustable gutter hanger assembly having first and second gutter hanger elements which are adjustably secured to each other and secure a gutter having its innermost vertical wall in spaced outward position with respect to the adjacent fascia or other building surface. The first gutter hanger element may have a body portion, a downwardly directed rear flange and an upwardly directed outer flange with reinforcing means being provided within the body and rear flange. The second gutter hanger element may have a reinforcing body portion and an upwardly open rearwardly disposed channel. The reinforcing means are preferably integrally formed hollow ribs.

A second embodiment wherein the first gutter hanger element has a body portion, a forwardly disposed inwardly open channel and a rearwardly disposed upwardly open channel. A second gutter hanger element secured to the first, preferably by integral fastening means. The second element has an anchoring portion and a forwardly and downwardly inclined upper flange which overlies and is closely adjacent to the upwardly open channel of the first element.

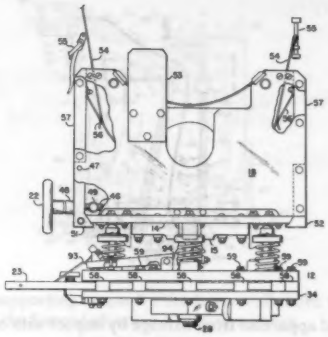
3,752,429

THREE AXIS SIMULATOR

Chester L. Reed, Burbank, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 3, 1972, Ser. No. 268,338
Int. Cl. F16m *13/00*
U.S. Cl. 248—179 **12 Claims**

A test fixture is provided with selective movement capability along any one of three mutually orthogonal axes. An adjustable support means is configured to support any of a plurality of devices to be tested on the fixture such as to position the center of gravity above the intersection of the axis of movement. A lock mechanism prevents movement of the support fixture about nonselected axes. An interlock is provided for the lock mechanism to prevent movement along the undesired ones of the mutually perpendicular orthogonal axes



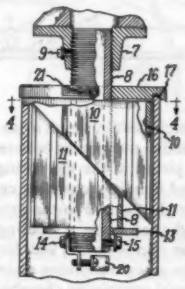
and to permit movement along the selected axis in dependence on the interlock position.

3,752,430

LUMINAIRE MOUNTING DEVICE

Lewis W. Kenyon, Flat Rock, and Robert G. Kilpatrick, Hendersonville, both of N.C., assignors to General Electric Company, Pittsfield, Mass.

Filed Apr. 24, 1972, Ser. No. 246,915
Int. Cl. F16m *13/00*
U.S. Cl. 248—226 R **9 Claims**



Device for mounting a luminaire on a hollow pole includes a pair of superposed slidable tubular members arranged in wedging engagement inside the pole. The tubular wedge members are forced into sliding wedging engagement and frictional contact with the inside of the pole by an adjusting nut resting on top of the pole and threaded on a central pipe secured at its top to the luminaire and supporting the lower wedge member at its bottom. The wedge members are formed to contact the pole at a plurality of spaced regions.

3,752,431

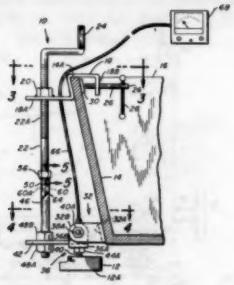
APPARATUS FOR MOUNTING A TRANSDUCER TO THE TRANSOM OF A BOAT

William E. McBride, Tulsa, Okla., assignor to Lowrance Electronics Mfg. Corp., Tulsa, Okla.

Filed Sept. 10, 1971, Ser. No. 179,425
Int. Cl. H04r *1/44*
U.S. Cl. 248—291 **2 Claims**

This invention relates to apparatus for elevational control of a sonic transducer from the transom of a vessel. The configuration comprises means for mounting a sonic transducer upon a transom of a vessel in order to gain elevational control of the

azimuth of the sonic transducer in relation to the water line and further provides a means for protecting the sonic transducer and apparatus from damage by impact with objects during use.

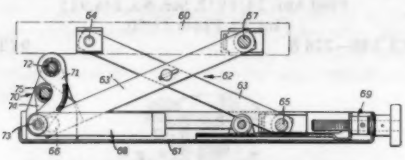


3,752,432

VEHICLE SEATS

Frederick George Lowe, Northampton, England, assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 31, 1970, Ser. No. 103,248
Int. Cl. F16m *11/00*
U.S. Cl. 248—400 **3 Claims**



An improved vehicle seat in which a gas spring is connected to and dampens relative movement between a base part and a seat part. A drive piston in the gas spring is movable within and allows restricted flow in a chamber containing liquid in a cylinder. A piston rod attached to the drive piston passes out one end of the cylinder while a floating piston within the cylinder serves as an opposing end wall for the liquid containing chamber and for a gas containing chamber located on the other side of the liquid containing chamber. Movement of the drive piston further into the cylinder is dampened by the restricted flow of liquid in the liquid containing chamber and further dampened by compressing the gas in the gas containing chamber.

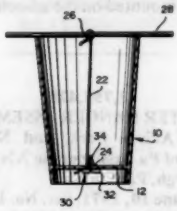
3,752,433

TRANSLUCENT PLASTIC CANDLE MOLD

Mort R. Berman, Brooklyn, N.Y., assignor to Avalon Industries, Inc., Brooklyn, N.Y.

Filed Dec. 10, 1971, Ser. No. 206,755
Int. Cl. B29d *31/00*
U.S. Cl. 249—94 **6 Claims**

Apparatus for and method of making a candle having a wick fixed there within. The apparatus is comprised of a container having a closed end and an open end. The container is tapered towards the closed end thereof and has a hole formed within the closed end. The open end of the container has a first and second pair of protruding portions extending therefrom wherein the first pair is diametrically located from the second pair. A wick is passed through the hole at the closed end of the container and is attached to a solid bar, which bar extends over the open end of the container. The wick is pulled taut so that the bar is forced against the open end of the container and rests between each of the pair of protruding portions so as to limit the movement of the bar in a direction transverse to the axis of the bar. The tautly pulled wick is fastened to the closed end of the container by a screw. Molten wax is poured through



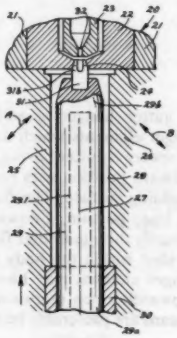
the open end of and into the container and allowed to cool so as to solidify. The wick is disengaged from the bar and the closed end of the container and the finished candle is then removed therefrom.

3,752,434

MOLDING OF ALL PLASTIC SHOTSHELL CASES

George L. Herter, Waseca, Minn., assignor to Herter's Inc., Waseca, Minn.

Filed Sept. 9, 1971, Ser. No. 178,943
Int. Cl. B22c *9/08*
U.S. Cl. 249—105 **1 Claim**



A mold and molding method for all plastic shotshell cases to inject the plastic into the mold cavity from a sprue at the center of the mold cavity forming the closed end of the shotshell case and to simultaneously fill all portions of the mold cavity without necessitating forming a weld line, and maintaining the entire periphery of the shotshell case uniform in thickness by holding the core within the mold cavity concentrically of the movable mold parts with a rigid core pin on the end of the core and seated in the sprue, the core pin having grooves for carrying molten plastic into the cavity while the pin is seated in the sprue for holding the core concentric of the mold cavity.

3,752,435

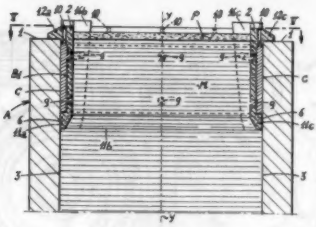
INGOT-MOLDS COMPRISING INGOT INSULATING MEANS

Henri-Jean Daussan, Rte. Touristique, Longeville-les-Metz, France

Division of Ser. No. 40,187, May 25, 1970, Pat. No. 3,672,433.
This application Mar. 29, 1972, Ser. No. 239,118
Claims priority, application France, June 2, 1969, 6918293
Int. Cl. B22d *7/10*
U.S. Cl. 249—106 **5 Claims**

The invention relates to ingot-molds which are intended to be stripped from ingots very shortly after filling. The ingot-

mold comprises ingot insulating means comprising a heat-insulating lining fixed along the internal surface of the mold near the upper portion thereof; the lining has a bottom portion applied without clearance against said internal surface and above said bottom portion, a recessed portion which provides



a peripheral gap between said lining and said internal surface; the lining is further provided with lateral openings establishing a communication between said peripheral gap and the space inside the lining and with vents establishing a communication between the top portion of said peripheral gap and the atmosphere.

3,752,436

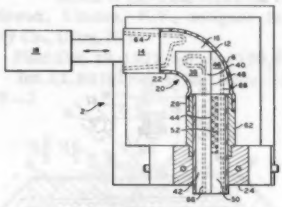
APPARATUS FOR MOLDING ARTICLES HAVING A NONLINEAR CHAMBER

Peter R. Deutsch, Titusville, Pa., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 99,847, Dec. 21, 1970, Pat. No. 3,711,590. This application Sept. 28, 1972, Ser. No. 292,900

Int. Cl. B22c *9/24*

U.S. Cl. 249—145 **8 Claims**



A first molding core is positioned within a first portion of a separable mold having a nonlinear chamber. A second molding core having an end matable with the end of the first core is inserted within a second end portion of the chamber of the mold adjacent and in slidable contact with a third molding core. The first molding core is retractable from the mold and the second and third molding cores are pivotally connected to one of the mold sections for removing the molded article and the second and third molding cores from the mold section. The third molding core is slidable along the second molding core for releasing the article from the second and third molding cores.

3,752,437

MOLD CAPABLE OF BEING OPENED AND CLOSED

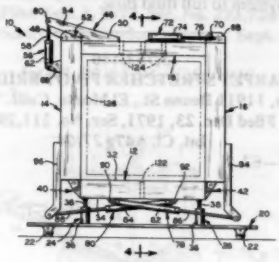
Glen W. Saidla, Wyomissing Hills, Pa., assignor to Dana Corporation, Toledo, Ohio

Filed Dec. 2, 1971, Ser. No. 204,287

Int. Cl. B41b *11/54*

U.S. Cl. 249—172 **6 Claims**

A mold which is capable of being closed to form a peripherally enclosed cavity within the mold and is formed from a lower wall, a pair of side walls hinged to pivot with respect to the lower wall and a top wall hinged to pivot relative to one of the side walls. Because of the pivotal movement, the top and side walls, upon pivoting to an open position, move in a peeling manner with respect to an object formed therein,



while the supporting means for the lower wall move the latter away from the formed object in a peeling manner.

3,752,438

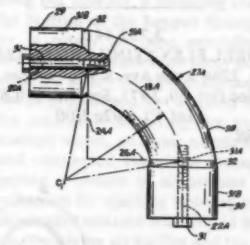
ONE PIECE ELBOW MOLD

James B. Baillie, Ancaster, Ontario, Canada, assignor to Ameron, Inc., Monterey Park, Calif.

Continuation-in-part of Ser. No. 163,211, July 16, 1971, abandoned. This application Aug. 20, 1971, Ser. No. 173,393

Int. Cl. B28b *7/28*

U.S. Cl. 249—184 **8 Claims**



A pipe elbow with an integral female socket joint portion is formed on an internal mold. The center of curvature of the curved portion of the mold is displaced slightly outwardly of a plane perpendicular to the longitudinal axis of the socket and passing through the juncture of the socket and the curved portion to permit withdrawal of the curved portion of the mold without touching the inner wall of the socket portion.

3,752,439

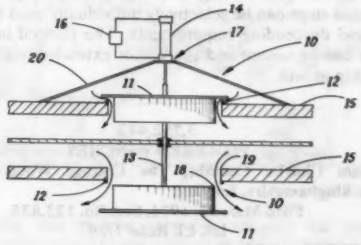
DAMPER ARRANGEMENT

John Thomas, Louisville, Ky., assignor to American Air Filter Company, Inc., Jefferson County, Ky.

Filed Nov. 15, 1971, Ser. No. 198,748

Int. Cl. F16k *47/00*

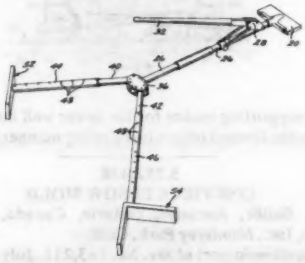
U.S. Cl. 251—121 **10 Claims**



A damper arrangement wherein a damper blade opens and closes a flow through orifice and wherein a baffle means is

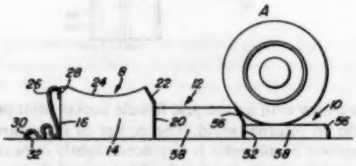
provided which maintains an opening of constant cross section during a portion of the stroke of the damper blade to provide a buffered transition when removing a fluid system from or returning a system to full fluid flow.

3,752,440
CARPET STRETCHER PIVOT BRIDGE
Jon C. Ream, 11911 Deona St., El Monte, Calif.
Filed Dec. 23, 1971, Ser. No. 211,295
Int. Cl. A47g 27/04
U.S. Cl. 254—62 **5 Claims**



A device to provide a strong, mobile, and properly aligned pivot point, from which to stretch carpet, with a carpet stretcher.

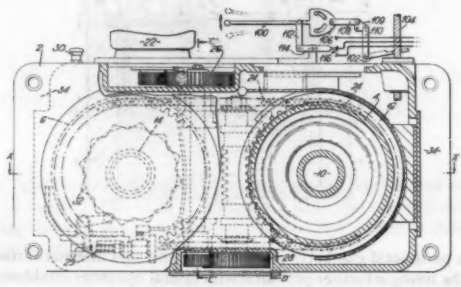
3,752,441
VEHICLE WHEEL ELEVATING AND LEVELING DEVICE
John E. Rogers, 2266 Avon Ave. S.W., Camden, Ark.
Filed Oct. 20, 1971, Ser. No. 190,829
Int. Cl. E02c 3/00
U.S. Cl. 254—88 **7 Claims**



A wheel elevating, leveling and chocking device useful as (1) a lift and (2) a scotch (chock) for a camper wheel. It is of elongated stepped construction in that it embodies several step-like sections which are oriented in end-to-end alignment, are telescopingly united, and can be extended for ramp-like use and alternatively retracted and collapsed. The sections are hollow and block-like and are capable of being telescoped and compactly collapsed for convenient handling and storage. Each section is basically alike in that it comprises a vertically walled base portion providing a riser and a top horizontal wall or platform constituting a wheel seating tread. The thus oriented steps can be selectively individually used for ascending and descending requirements. The flanged bottom portions can be nested and stacked or extended into flush relationship at will.

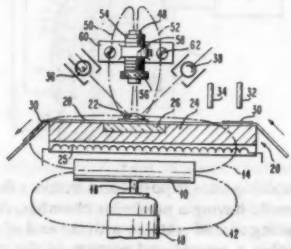
3,752,442
POWERED WINCHES
William Charles Coombs, The Cottage Wood Ln., Iver Buckinghamshire, England
Filed Mar. 12, 1971, Ser. No. 123,835
Int. Cl. B66d 1/26
U.S. Cl. 254—185 R **3 Claims**

This invention relates to powered winches, preferably electrically powered, comprising in combination a housing, a plurality of rotatable drums, a worm and worm wheel drive by means of which the rotatable drums are rotated from a power source, a diaphram dividing the winch housing interior into an oil-present drive part and an oil-free cable part, and a cable tensioning means, the winch being such that in use a cable



passes through the winch after engaging said rotatable drums and said cable tensioning means, said cable tensioning means being such as to act on constantly differing adjacent portions of the cable, and said portions of the cable always being of the same length.

3,752,443
MAGNETIC MIXER
Bernard Lichtenstein, Yorktown Heights, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.
Filed Dec. 13, 1971, Ser. No. 207,196
Int. Cl. G01n 21/24; B01f 13/08
U.S. Cl. 259—1 R **13 Claims**



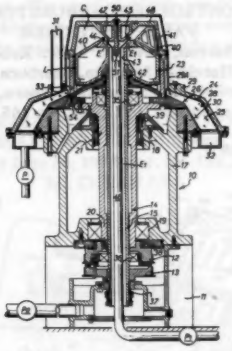
A magnetic mixer for laboratory use which includes a permanent magnet mounted for rotation and driven on an axis centrally between its poles. A volume of combined liquids, containing in addition a multiplicity of magnetic particles, is supported centrally with reference to the magnet poles for activation of the particles in the rotating magnetic field to mix the liquids to achieve a reaction between them or merely a blending. This rotational force on the mixture has the effect of redistributing the magnetic particles away from the center of the mixture which effect, unless countered, lessens the mixing action. A second permanent magnet is provided having its poles in substantial alignment with the first mentioned axis, and having one of these last-mentioned poles spaced a distance nearer to the mixture than the other pole thereof, the magnetic field of the second magnet being substantially at right angles to the magnetic field of the first magnet. The field of the second magnet effectively counters by attraction the aforementioned redistributing movement of the magnetic particles, and the resultant particle distribution is substantially uniform throughout the combined liquids.

3,752,444

APPARATUS FOR MIXING FLUIDS

Pierre Foucault, 12, Avenue du Vesinet, Croissy sur Seine, France

Filed Aug. 3, 1971, Ser. No. 168,627
Int. Cl. B01f 13/00
U.S. Cl. 259—2 12 Claims



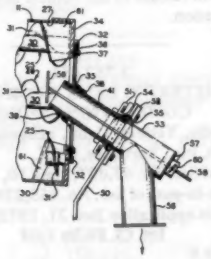
Mixing apparatus comprises co-axial fluid supply passages opening into an expansion and mixing chamber into which the fluids pass as a mist, the chamber being formed between two members which rotate in opposite directions, one carrying blades which pass through the chamber. The chamber leads through an annular throttle passage between rotating walls to a homogenisation chamber in which a mixer rotates.

3,752,445

SCREW LIFTER MIXER

Leon J. Nowak, Clinton, N.Y., assignor to Munson Mill Machinery Co., Utica, N.Y.

Filed Oct. 19, 1971, Ser. No. 190,518
Int. Cl. B01f 9/06, 15/02; B28c 7/16
U.S. Cl. 259—3 3 Claims



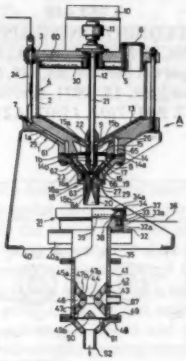
A mixer for particulate material has a cylinder supported for rotation about a substantially horizontal axis, the support means being adjustable for elevating its receiving end so as to be operated as a continuous mixer. A plurality of helically flanged screw tubes extend longitudinally as lifters, having their ends secured to the end walls of the cylinder adjacent the wall periphery. As the cylinder rotates the material being mixed is picked up and released by the screw flanges so as to shift parts of the mix axially in either direction. When the receiving end is elevated the total mix is also continually shifted by the incline of the cylinder toward the discharge end. Axial openings at either end are closed by diaphragms, each secured at its center to a rotating tube maintained at a constant angle to the axis of the cylinder by a floor supported bushing.

3,752,446

APPARATUS FOR DISSOLVING POWDER IN WATER

Akira Watanabe, Numazu, Japan, assignor to Akatake Engineering Company Limited, Shizuokaken, Japan

Filed Feb. 2, 1972, Ser. No. 222,726
Claims priority, application Japan, Sept. 27, 1971, 46/74608
Int. Cl. B01f 5/04, 7/26, 13/10
U.S. Cl. 259—7 11 Claims



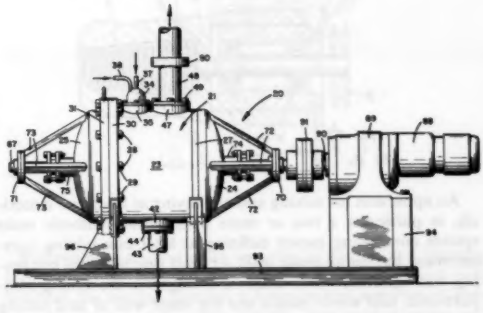
The apparatus for dissolving powder in water comprises a hopper containing the powder, a metering chamber communicated with the bottom of the hopper through a passage to receive powder, a rotary air pipe extending through the hopper into the metering chamber, an inner nozzle connected to the lower end of the rotary air pipe in the metering chamber to eject a stream of pressurized air, a stirrer mounted on the inner nozzle for uniformly admixing the powder with the stream of pressurized water, an outer nozzle coaxial with the inner nozzle and connected therewith through a discharge passage for ejecting a stream of air-powder mixture and a water spray mechanism for ejecting whirling water jet against the stream of air-powder mixture whereby to form a stream of mist like mixture containing air buffles and the powder in contact with water.

3,752,447

MIXER APPARATUS

James Y. Chen, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 16, 1971, Ser. No. 172,147
Int. Cl. B01f 7/04
U.S. Cl. 259—10 9 Claims



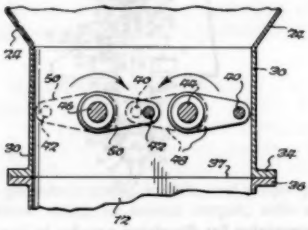
A housing and paddle assembly adapted for use in processing and mixing highly viscous fluids is provided. The mixer employs a paddle assembly having a shaft which rotates about a horizontal axis. The assembly has at least two pairs of

blade members. The members of each pair are symmetrically positioned about the shaft and extend axially in one half of the housing. The blade members of each pair may be slotted at diagonally opposite outside ends. In operation, the paddle assembly can sweep out substantially all of the housing interior and can produce simultaneously in a fluid cyclical vertical displacement, rolling action, horizontal displacement, and, even, fold over action.

3,752,448
DOUGH CONDITIONING APPARATUS

Anthony F. Madonia, 19 Middlebury Ln., Buffalo, N.Y.

Continuation-in-part of Ser. No. 83,339, Oct. 23, 1973. This application Sept. 15, 1971, Ser. No. 180,650
Int. Cl. B01f 7/02, 15/02; A21c 1/06
U.S. Cl. 259—186 **3 Claims**

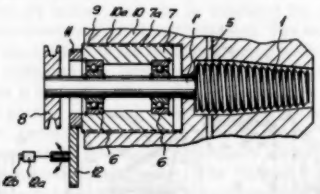


A hopper for receiving a dough mixture directly from a mixing chamber and gravity feeding the same to a dough divider. A plurality of agitator rods mounted in the hopper condition and work the dough mixture to dispel excessive gases generated therein and render the mixture soft, elastic and of a uniform consistency and texture prior to the admission of the mixture directly into a dough divider.

3,752,449
APPARATUS FOR MIXING AND CONVEYING MATERIALS

Johann Schwab, Vienna; Albert Zehner, Pfaffstatten; Egon Kratochvil, Modling, all of Austria, and Friedrich Walter, Bremen, Germany, assignors to Semperit Aktiengesellschaft, Vienna, Austria, and Desma-Werke GmbH, Postfach, Achim, Germany

Filed Dec. 4, 1970, Ser. No. 95,181
Claims priority, application Austria, Dec. 17, 1969, A11752/69
Int. Cl. B01s 7/08
U.S. Cl. 259—191 **13 Claims**

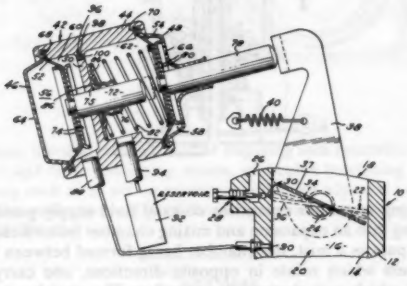


An apparatus for mixing and conveying at least two materials, in particular a two or more component synthetic resin system comprising means defining at least one mixing compartment having an inner wall. At least one material conveying- and agitation worm means is arranged in the mixing compartment, said worm means and the inner wall of said mixing compartment surrounding said worm means at least partially possessing a conical configuration. There is also provided means for moving said worm means and mixing compartment relative to one another in axial direction. This invention also teaches a novel worm construction for use in such mixing compartment which comprises a worm element consisting of a number of worm sections arranged in a row next to one another in the axial direction of the worm element, at least one worm section possessing threads with a different pitch than the remaining worm sections and the number of threads of all worm sections being equal.

3,752,450
VACUUM CONTROLLED CARBURETOR THROTTLE VALVE POSITIONER

William W. Charron, Orchard Lake; Robert S. Harrison, Detroit, and Harold E. Marcum, Dearborn, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed July 26, 1971, Ser. No. 165,991
Int. Cl. F02m 3/02
U.S. Cl. 261—39 R **6 Claims**

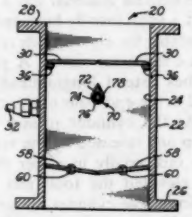


A downdraft type carburetor has an idle system discharge port that is straddled by the normal idle speed and closed throttle positions of the throttle valve so as to permit idle speed fuel and air flow in one position and no flow in the other position; a third beyond normal idle, or fast idle speed position is provided for engine startup; the three positions are controlled by a servo operatively engaging the throttle valve; the servo operation is controlled by intake manifold vacuum to initially close the throttle valve upon engine shut off, with a subsequent return of the throttle valve to its fast idle position for engine restarting, or to return the throttle valve to a normal idle position upon release of the vehicle accelerator pedal during engine operation.

3,752,451
FUEL METERING DEVICE FOR INTERNAL COMBUSTION ENGINE

Willard Z. Kendig, Yettem, Calif., assignor to Pollution Control Industries, Inc., Torrance, Calif.

Continuation of Ser. No. 45,037, June 10, 1970, abandoned, Continuation-in-part of Ser. No. 865,239, Oct. 10, 1969, abandoned. This application Jan. 21, 1972, Ser. No. 212,687
Int. Cl. F02m 9/08
U.S. Cl. 261—39 B **8 Claims**



A downdraft carburetor of the air valve type having a mixing passage provided at its upstream end with two pivoted

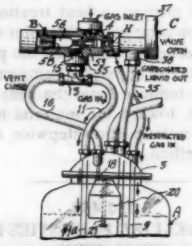
plates or air valves forming a variable venturi, and provided with two pivoted throttle plates adjacent its downstream end. A fuel spray bar in the mixing passage between the venturi plates and the throttle plates discharges fuel into the mixing passage and is supplied with fuel by a pivoted pickup arm movable in a fuel chamber over a calibrated metering ramp which cooperates with the free end of the pickup arm to form a variable fuel metering clearance therebetween. The fuel chamber may be pressurized, or the level therein may be controlled by a float. The venturi plates are biased closed by springs, one of which is a bimetallic spring coming into operation only when the engine is cold to provide a choke.

3,752,452

GAS-OPERATED CARBONATING APPARATUS

Frank M. Iannelli, 5 Penwood Rd., Livingston, N.J.

Filed June 30, 1971, Ser. No. 158,277
Int. Cl. B01f *3/04*
U.S. Cl. 261—52 **5 Claims**



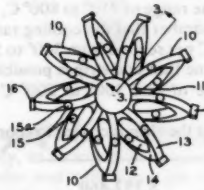
Carbonating apparatus includes a single tank or chamber for carbonating, cooling, mixing and dispensing a liquid and having an inlet for liquid to be carbonated, and a valve-controlled dispensing outlet, a restricted inlet for continuous inflow of gas and another inlet for intermittent inflow of gas and controlled by a valve that is opened when the dispensing valve is opened to admit gas for dispensing the liquid and coacts with a liquid-level controlled gas vent valve that is open to vent gas from the tank and is closed when the liquid level rises to a predetermined point, and to prevent excessive escape of gas during the lowering of the liquid level and while the liquid level controlled valve is open.

3,752,453

PACKING MATERIAL UNIT

Richard F. Doyne, Summit, Ohio, assignor to The Ceilcote Company, Inc., Berea, Ohio

Filed Feb. 19, 1971, Ser. No. 117,028
Int. Cl. B01f *3/04*
U.S. Cl. 261—94 **19 Claims**



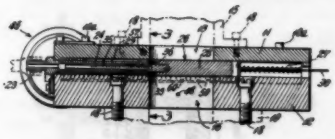
A packing material unit for liquid-gas contact apparatus which is essentially six to 12 turns of a helix arranged about a circle and having the ends joined to form a torus. The helix comprises a filamentous material, and each loop of the helix is preferably or substantially circular. The loops carry one or more sharply defined surface interruptions in the form of abrupt nicks or projections, and preferably knobs and notches on exposed surfaces of the torus.

3,752,454

FUEL INJECTING CARBURETOR

Jozsef Korponay, 22 Corona Dr., Milford, Conn.

Filed Aug. 6, 1971, Ser. No. 169,783
Int. Cl. F02m *9/06*
U.S. Cl. 261—41 B **1 Claim**



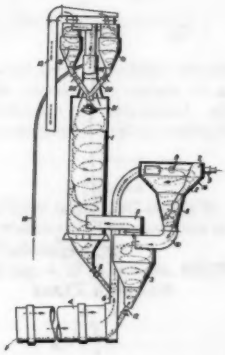
There is disclosed a fuel injector for internal combustion engines having a rectangular throat and a valve in the throat having a gate located in the throat between air intake and outlet chambers, the gate being mounted to slide across the throat by operation of an accelerator to control the quantity of air passing through the throat to the intake manifold, there being a series of fuel jet ports in the throat arranged to be opened successively as the valve gate opens and closes the throat to eject fuel into the air stream passing through the throat, the proportion of air and fuel once determined being constant through the full range of acceleration and deceleration of the engine. The proportion may be varied by controlling the output pressure of a pressure regulato between the fuel supply and the carburetor.

3,752,455

ARRANGEMENT FOR BURNING OF PULVERULENT AND FINE GRAIN MATERIAL

Zdenek Zacpal, Horni Mostenice, and Petr Nemecek, Prerov-Sirava, both of Czechoslovakia, assignors to Prerovske strojirny, narodni podnik, Prerov, Czechoslovakia

Filed Aug. 21, 1969, Ser. No. 856,522
Int. Cl. F27b *15/00*
U.S. Cl. 432—58 **8 Claims**

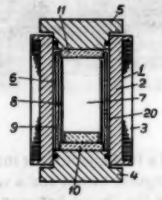


Pulverulent and fine grain material is burned in a burning aggregate of the cyclone type, into the upper cylindrical part of which the treated material is entrained by a stream of preheated air terminating tangentially into said burning aggregate, whereby particles of larger size forced by centrifugal force to the circumference of the cyclone remain in the burning zone longer than particles of smaller size, which occupy the central part of the cyclone.

3,752,456
VERTICAL TUBULAR FURNACE FOR HIGH OPERATING PRESSURES

Hans Larker, Robertsfors, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Mar. 1, 1972, Ser. No. 230,898
Claims priority, application Sweden, Mar. 15, 1971, 3282/71
Int. Cl. F27b 3/02
U.S. Cl. 263—40 R 8 Claims

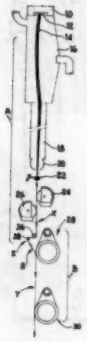


A cylindrical elongated electric furnace placed in a pressure chamber for isostatic compression with its longitudinal axis substantially vertical. A heat-insulating mantle is provided for thermal isolation of the hot furnace chamber from the walls of the pressure chamber. This mantle is constructed of thin sheet metal arranged on a tubular frame and is free from insulating material of ceramic type. The sheet metal forms a plurality of cylindrical or conical layers located radially one outside the other and having gas-filled spaces between them.

3,752,457
METHOD AND EQUIPMENT FOR CONTINUOUSLY SPINNING AND STRETCHING SYNTHETIC FILAMENTS

Paolo Parmeggiani; Domenico Nicita, and Bruno D'Alo', all of Milan, Italy, assignors to Snia Viscosa Societa Nazionale Industra Applicazioni Viscosa, Milan, Italy

Filed Dec. 1, 1970, Ser. No. 93,973
Claims priority, application Italy, Dec. 4, 1969, 2535 A/69
Int. Cl. D01d 5/12
U.S. Cl. 264—210 F 4 Claims

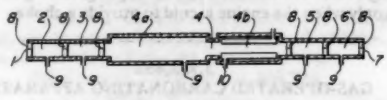


A method and apparatus for continuously carrying out spinning and stretching operations on extruded synthetic filaments, wherein, between a conventional spinning apparatus and a conventional stretching apparatus for continuous treatment of the filaments, a bending and stretching action is imparted to the filaments by means of stationary bending means adapted to exert a predetermined frictional resistance on the running filaments.

3,752,458
CONTINUOUS HEAT TREATMENT METHOD AND APPARATUS MAINLY FOR REACTIVE METALS

Shoichi Tokuda, Kobe; Shitoshi Ohtani, Suita, and Minoru Nisigaki, Akashi, all of Japan, assignors to Kobe Steel, Ltd., Fukiai-ku, Kobe-shi, Japan

Filed Nov. 16, 1970, Ser. No. 89,566
Claims priority, application Japan, Nov. 15, 1969, 44/91661
Int. Cl. C21d 9/56
U.S. Cl. 266—3 R 2 Claims

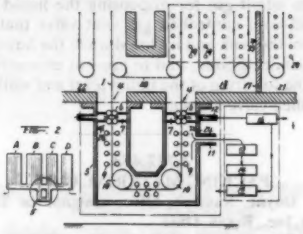


A method of continuously heat treating reactive metals by passing the reactive metal through an heat treatment apparatus in which an inert gas is maintained at a pressure higher than atmospheric pressure and the interior of which is divided into a material inlet portion, a heat treating portion and a material outlet portion arranged in the order mentioned with a lip seal interposed between each other, the pressure distribution of the inert gas in the apparatus being such that the pressure is progressively reduced from the heat treating portion wherein it is highest, toward the material inlet portion and toward the material outlet portion stepwise; and an apparatus for practicing said method.

3,752,459
CONTINUOUS ANNEALING FACILITIES FOR DRAWING STEEL STRIP

Yoshiaki Kawazoko; Hiroyuki Kuroda, and Katsuhiko Hirogami, all of Fukuyama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1970, Ser. No. 98,734
Claims priority, application Japan, Dec. 16, 1969, 44100594
Int. Cl. C21d 1/64
U.S. Cl. 266—3 R 1 Claim



A continuous annealing facilities substantially comprising the following devices:

heating and soaking zones that the temperature of passing strip is within the range of 710° to 800° C,

a rapid cooling chamber that the cooling rate of said strip is more than 50° C per second from 300° to 500° C

a shelf treating zone that said strip is possible to maintain at the temperature of said 300° to 500° C for at least 10 seconds, and

a cooling zone that the strip is cooled to room temperature.

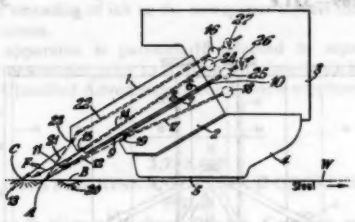
3,752,460
OXYGEN TRAP SCARFING APPARATUS

Thomas James Lytle, West Orange, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 836,233, June 25, 1969, Pat. No. 3,647,570. This application Feb. 17, 1972, Ser. No. 227,147
Int. Cl. B23k 7/00
U.S. Cl. 266—23 H 2 Claims

The time required for scarfing the surface of a metal body is decreased by shortening the preheating time. This is accom-

plished by directing a row of "trap" oxygen streams from ports located above the upper preheat fuel gas ports so that the oxygen streams form a plane which intersects the surface of the metal body in such way as to form a wedge shaped pocket to



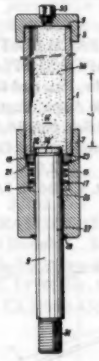
confine the burning preheating gases. This results in faster puddle formation and causes the puddle to be formed at a location just ahead of the projected converging point of the fuel and oxygen gas streams, rather than in back of the converging point where it would be formed by prior art methods.

3,752,461

PNEUMATIC SPRING DEVICES

Jean Louis Gratzmuller, 66 Boulevard Maurice Barres, Neuilly-sur-Seine, France

Filed Nov. 9, 1971, Ser. No. 197,076
Claims priority, application France, Nov. 13, 1970, 7040607
Int. Cl. F16f 9/02
U.S. Cl. 267—113 **16 Claims**



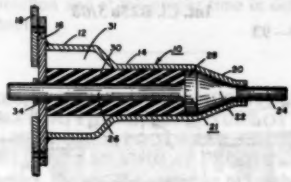
A pneumatic spring device includes a cylinder assembly and a piston assembly, so arranged that a compartment is defined within the cylinder, and is filled by a gas, which, under normal conditions, is less dense than nitrogen, preferably helium, and is under high pressure (300 to 1000 bars). When the gas in the compartment is compressed by movement of the piston assembly within the cylinder, a large reserve of energy is thus made available in a small volume, and is maintained, despite variations in temperature. Control means, preferably in the form of an hydraulic jack arrangement, is provided for releasing this energy, and the piston assembly is connected to a device, particularly an electrical circuit breaker for the control thereof.

3,752,462

ELASTOMERIC SPRING AND FRICTIONAL DAMPING SHOCK ABSORBER

George W. Wight, Jr., Huron, Ohio, assignor to Clevite Corporation, Chicago, Ill.

Filed May 14, 1971, Ser. No. 143,544
Int. Cl. F16f 7/00
U.S. Cl. 267—140 **12 Claims**



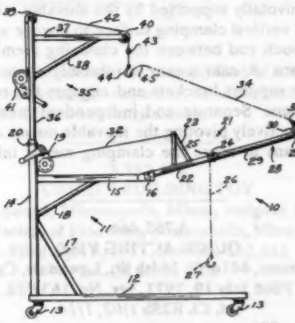
An elastomeric shock absorber for interposition between an automotive chassis and bumper. The device includes an elastomeric tube arranged partly peripherally constrained and partly unconstrained in a tubular casing. A piston in the casing axially loads the elastomeric tube.

3,752,463

AUTO HOOD REMOVER AND INSTALLER

August W. Schilke, 311 Garfield, Almena, Wis.

Filed Nov. 29, 1971, Ser. No. 202,832
Int. Cl. B23q 3/00
U.S. Cl. 269—17 **1 Claim**



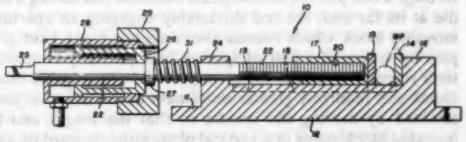
A device for auto service facilities whereby a mechanic working alone can remove and replace an auto hood. This device is a combination of articulated, adjustable winch operated members mounted on a floor-rolling frame.

3,752,464

WORK HOLDING DEVICE

Geza M. Csatlos, Wadsworth, Ohio, assignor to Karg Machine Products, Inc., Tallmadge, Ohio

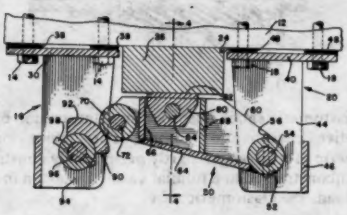
Filed Aug. 4, 1971, Ser. No. 160,764
Int. Cl. B23q 3/08
U.S. Cl. 269—32 **2 Claims**



Work holding device or vise with a base, fixed and movable work engaging surfaces or jaws, and dual means — fluid-pres-

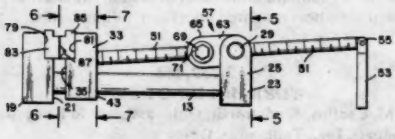
sure actuated and manually actuated — for positioning the jaws relative one to the other.

3,752,465
CLAMPING DEVICE FOR ANODE RODS
Frederik Willem Siegmund, Bilthoven, Netherlands, assignor to N.V. Nederlandse Kraanbouw Mij, Utrecht, Netherlands
Filed Feb. 9, 1971, Ser. No. 113,944
Int. Cl. B25b *5/08*
U.S. Cl. 269—93 **4 Claims**



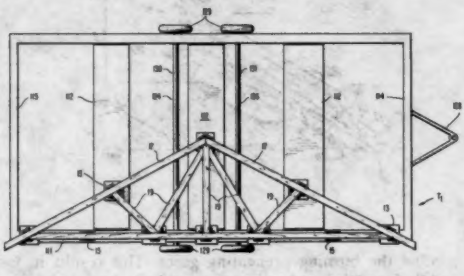
A conductive bus-bar means includes a flat vertical clamping surface. A clamping means includes a pair of spaced support brackets carried by the bus-bar means. A movable means is pivotally supported by one of said support brackets and a roller is carried at the outer free end thereof. A clamping member is pivotally supported by the movable means and includes a flat vertical clamping surface to engage an anode rod and clamp such rod between the clamping member and the bus-bar means. A cam means is rotatably supported by the other of the support brackets and engages the roller on the movable means. Separate and independent means are provided for selectively pivoting the movable means and rotating the cam means to move the clamping means into clamping position.

3,752,466
QUICK-ACTING VISE
Nordahl Johnson, 4416 W. 164th St., Lawndale, Calif.
Filed July 19, 1971, Ser. No. 163,974
Int. Cl. B25b *1/02, 1/14*
U.S. Cl. 269—201 **7 Claims**



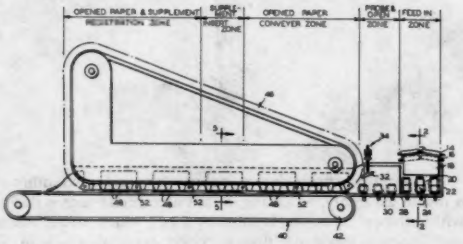
A vise having a jaw moving along parallel rails between a fixed jaw and an anchor block, the movable jaw is coupled through a ball joint to an elongated threaded rod having a handle at its far end, the rod threadably engaging an apertured movable block which rotates about anchor block-held pivot pins by means of a pair of spaced links pivotally coupled at their respective ends to the pivot pins and the movable block. Quick and relatively greater movement of the movable jaw is attained by moving the handle so that the length and the movable block move in a vertical plane either toward or away from the fixed jaw, while a fine adjustment and power tightening or clamping of the vise jaws is attained by rotating the threaded rod, once the rod is moved forward and its longitudinal axis lies just below the longitudinal axis of the pivot pins.

3,752,467
PORTABLE ROOF TRUSS AND JOIST ASSEMBLING APPARATUS
James M. Stanley, Vicksburg, Miss., assignor to Multi-Systems, Inc., Vicksburg, Miss.
Filed May 19, 1971, Ser. No. 144,794
Int. Cl. B23g *3/10*; B25h *5/00*; B27f *7/02*
U.S. Cl. 269—321 F **3 Claims**



A portable roof truss and floor joist fabricating apparatus which is a "jig-like" fabricating table on which is positioned a plurality of bracket plates for retaining the frame members in an assembled condition for fastening. The fabricating table comprises an elongated lower chord support beam as one side of the fabricating table and contains on one side thereof a plurality of mounting points to which are held a plurality of outwardly extending extension beams. On each extension beam and the lower chord support beam are mounted at least one detachable bracket plate with blocking brackets attached thereto for properly positioning each frame member. The members are fastened with toothed nailing plates or more preferably truss nails fastened through truss plates positioned on opposites sides of the frame members at the joint. In a preferred embodiment the frame members are secured by nails clinched with a ribbed clinching plate.

3,752,468
APPARATUS TO FACILITATE INSERTION OF NEWSPAPER SUPPLEMENTS
Charles H. Hart, Nazareth, Pa., and George R. Cashau, Philipsburg, N.J., assignors to Anpa, Easton, Pa.
Continuation-in-part of Ser. No. 84,329, Oct. 27, 1970, Pat. No. 3,711,084. This application Oct. 26, 1971, Ser. No. 192,094
Int. Cl. B65h *5/30*
U.S. Cl. 270—57 **12 Claims**



Apparatus to facilitate insertion of newspaper supplements including means for separating a bundle of sheets comprising a folded newspaper. Means are included for feeding in folded newspapers, advancing the newspaper vertically along a lineal plane with baffle means supporting the newspaper; a plurality of drive rollers extending through the baffle on either side of the conveyer, so as to engage the folded sides of the newspaper and urge the newspaper downwardly and forwardly

along a conveyor support; a pointed probe longitudinally aligned along the path of travel of the newspaper so as to engage the leading edge thereof at the top and separate the sheets laterally as they are advanced; a travelling conveyer for conveying the opened newspaper into and through a supplement insertion zone including a holddown and registry mechanism for the opened newspaper and supplement, and subsequent discharge. Means are also provided to minimize possible smearing of ink as the newspaper travels through the various zones.

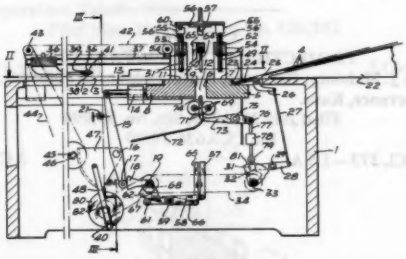
The apparatus is particularly adapted to separating a printed newspaper prior to stuffing with inserts such as a TV Guide, Classified Advertising, Book Review supplements, and the like.

3,752,469

FOLDING MACHINE AND METHOD OF PRESSING A FOLD

Hermann F. Kistner, Neckarweihingen, Germany, assignor to Maschinenbau Oppenweiler Binder & Co., Oppenweiler, Germany

Filed Aug. 7, 1970, Ser. No. 62,114
Int. Cl. B65h *45/00*
U.S. Cl. 270—61 **7 Claims**



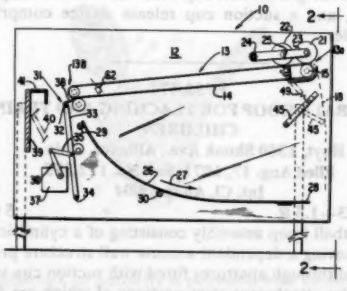
A folding machine comprising two pressure jaws and a method of pressing a fold into a flexible sheet material by means of these pressure jaws which are movable relative to each other and when separated define an intermediate slot, while the upper surfaces of these jaws at both sides of the slot form a part of a supporting surface for the sheet material. During the first part of the closing movement of the pressure jaws, the sheet material by being held in a fixed position on the jaws forms a loop in the slot which is then compressed into a fold when the jaws are completely closed.

3,752,470

SINGLE OPERATOR SHEET FOLDER

Benjamin Alvin Buss, and Donald C. Buss, both of East Moline, Ill., assignors to Ametek, Inc., New York, N.Y.

Filed Dec. 1, 1970, Ser. No. 94,094
Int. Cl. B65h *45/04*
U.S. Cl. 270—80 **1 Claim**



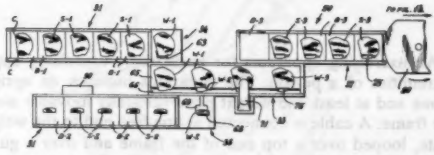
A sheet-folding machine has an endless belt conveyor for moving a sheet mounted between a pair of spaced end frames. A folder bar is pivotally mounted at the output end of the conveyor belt, and a curved operator bar is mounted below the input end of the conveyor belt so as to be pivotable between start and stop positions. The folder bar is preferably operated by an electric motor drive. A return chute is positioned below the conveyor belt and is adjustably mounted between the end frames. A control system is provided which is responsive to the movement of a sheet on the conveyor belt or which is responsive to the operator bar for actuating the folder bar in the proper direction and at the proper time in order to make folds in the sheet.

3,752,471

PROCESSES, SYSTEMS, AND COMPOSITE SYSTEMS FOR AUTOMATING THE MANUFACTURE OF WEARING APPAREL, HEADGEAR, FOOTWEAR, COMPONENTS THEREOF AND SIMILAR PRODUCTS

George F. Hawley, Bogota, N.J., assignor to Ivanhoe Research Corporation, New York, N.Y.

Division of Ser. No. 681,267, Nov. 7, 1967, Pat. No. 3,604,701.
This application Nov. 9, 1970, Ser. No. 87,744
Int. Cl. B65h *5/22*
U.S. Cl. 271—4 **15 Claims**



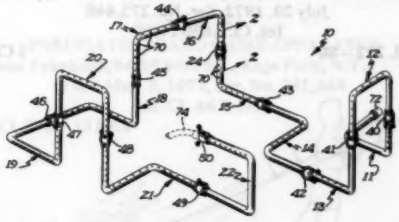
Processes and systems for automated feed of stacked fabrics on plural work tables, in sequence, to an infeed station and processing the fabrics at a work station.

3,752,472

CHILD'S BUILDING TOY

Timothy A. Snead, Minneapolis, Minn., assignor to The Minneapolis Society of Fine Arts, Minneapolis, Minn.

Filed Apr. 8, 1971, Ser. No. 132,441
Int. Cl. A63b *9/00*
U.S. Cl. 272—60 **8 Claims**



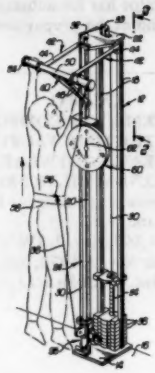
A child's building toy of various basic building units is disclosed each of which building units is in the form of an elongated double-ended member having at least one bend. Each basic building unit further includes a connector upon each end to allow a child to interfit and interconnect the basic building units to construct and interconnect an arrangement of basic building units of his own design comprising any number of units to the maximum number available. The basic building units are hollow to allow water to flow therethrough, and at least some of the units include apertures to allow the water to issue from them as a spray upon children climbing and otherwise playing upon an interconnected arrangement of the basic building units.

3,752,473

WEIGHT LIFTING TYPE EXERCISER WITH INDICATOR

Jack LaLanne, Hollywood, Calif., assignor to The Jack LaLanne Company, Glendale, Calif.

Filed Aug. 17, 1970, Ser. No. 64,542
Int. Cl. A63b *1/00, 21/06, 21/00*
U.S. Cl. 272—62 8 Claims



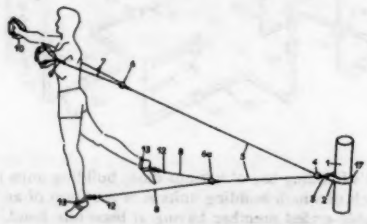
An exercising apparatus for particularly exercising upper extremities of a person. The apparatus includes an upright frame and at least one weight plate vertically movable along the frame. A cable is connected at one free end to the weight plate, looped over a top end of the frame and over a guide roller adjacent a lower frame end. A chin-up bar is connected to the upper portion of the frame and extends laterally away therefrom for the performance of chin-ups while the other free end of the cable is connected to the body of the exercising person so that he must lift the weight plate during each chin-up. A counter is coupled with the apparatus for visibly indicating to the user the number of times he performs a given exercise.

3,752,474

ARM AND LEG PUSH PULL TYPE EXERCISING DEVICE

Alcide R. Macabet, and Jean-Daniel Macabet, both of Boulevard de Dixmuole, Paris, France

Continuation of Ser. No. 116,865, Feb. 19, 1971, which is a division of Ser. No. 705,064, Feb. 13, 1968,. This application July 20, 1972, Ser. No. 273,440
Int. Cl. A63b *21/00*
U.S. Cl. 272—80 1 Claim



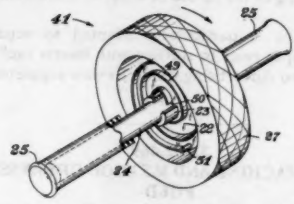
A portable exercise apparatus that has hand grips attached to opposite ends of a cable for reciprocation during an exercise. The hand grips are mounted on a separate cable reeved over a pulley. The apparatus also has, attached to the opposite end of the cable, straps that are attached to the feet of a user, which also are reciprocated during an exercise. The straps are attached to a separate cable reeved over a pulley.

3,752,475

AXLE-MOUNTED WHEEL EXERCISING DEVICE WITH SPRING RESISTANCE LOCATED CENTRALLY WITHIN THE WHEEL

Arnold C. Ott, 2512 Abbott Road, Apt. S–8, Midland, Mich.

Filed June 21, 1971, Ser. No. 155,057
Int. Cl. A63b *21/22*
U.S. Cl. 272—83 A 7 Claims



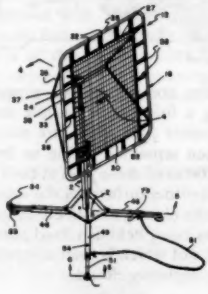
An exercise wheel or appliance comprises, in combination with a wheel which wheel is rotatable about a generally central axis of generation therefor, spring means in operative association with the wheel and axle for increasingly resisting rotation of the wheel with and upon increasing rotation of the wheel.

3,752,476

PROJECTILE RETURN APPARATUS

Elmo J. Mahoney, Dorrance, Kans., assignor to Mahoney, Inc., Dorrance, Kans.

Filed July 29, 1970, Ser. No. 59,096
Int. Cl. A63b *69/00*
U.S. Cl. 273—1.5 A 3 Claims



A backstop return panel is spaced forwardly from a rearwardly inclined, telescopic, support post by two pair of side braces. Each pair of side braces is secured to respective opposite ends of a shaft which in turn is mounted to the support post for pivotal movement about a horizontal axis by a releasable clamp. The support post is mounted to an X-shaped base. Each foot of the base is telescopic and has mounted at its outer end a flanged suction cup with a hole at the midpoint of the flange, and a suction cup release device comprising a pivoted roller.

3,752,477

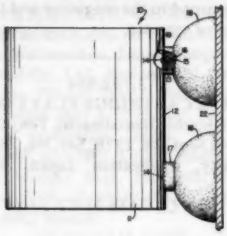
BASKETBALL HOOP FOR TEACHING AND TRAINING CHILDREN

Thomas R. Hoyt, 2380 Shunk Ave., Alliance, Ohio

Filed Aug. 17, 1971, Ser. No. 172,395
Int. Cl. A63b *63/04*
U.S. Cl. 273—1.5 R 5 Claims

A basketball hoop assembly consisting of a cylindrical ring structure having a dependent arcuate wall structure provided with spaced through apertures fitted with suction cup support members the attachment stem portions of which are formed with arcuate abutment faces to matingly overlie and grippingly

engage substantial areas of the arcuate wall structure surrounding the through apertures. The gripping engagement effectively secures the ring structure and arcuate wall structure

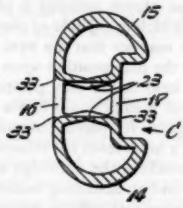


against movement in any direction relative to the stem portions to stabilize the ring structure against impact forces of the ball in use.

3,752,478
RACKET FRAME

Peter R. Flak, West Springfield, Mass., assignor to Questar Corporation, Toledo, Ohio

Filed Mar. 26, 1971, Ser. No. 128,232
Int. Cl. A63b *49/12*
U.S. Cl. 273—73 H **3 Claims**

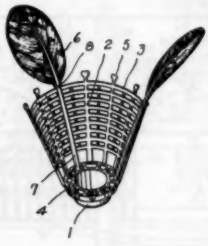


A tennis or the like game racket having a frame of extruded aluminum provided with a tri-hollow cross-section enabling the frame to be reduced in weight without detracting from the strength of the frame.

3,752,479
SHUTTLECOCK OR BUTTERFLY ADJUSTABLE IN RANGE AND SPEED

Kwang Chul Chung, 129-1, Kongduk-dong, Mapo-ku, Seoul, South Korea

Filed June 10, 1971, Ser. No. 151,856
Claims priority, application South Korea, June 10, 1970, 6100
Int. Cl. A63b *67/18*
U.S. Cl. 273—106 A **11 Claims**

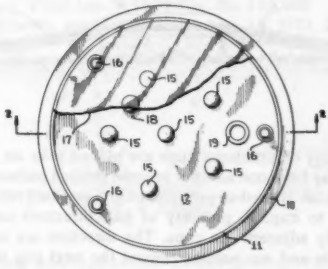


A shuttlecock or butterfly is provided with an arrangement in which gliding feathers are readily arrayed or rearrayed, attached onto or detached from so as the shuttlecock or butterfly itself be adjusted in its flying range and speed. The arrangement comprises a plurality of pits formed along the upper brim of the bottom cup portion of the basket-like main hopper body, a rib-like skirt portion, a plurality of vertical frames and a plurality of knob heads formed on the top of the vertical frames, protruding upwardly from the upper end of the skirt portion. The feathers are secured onto along the inner surface of the vertical frames with the foot portion of the quill inserted in the pits formed along the upper brim of the bottom cup portion and the upper portion of the quill at the middle of the feather tied onto the knob heads formed on the top of the vertical frames by such fastening means as string, wire or adhesive tape.

3,752,480
GAME EMPLOYING TILTABLE GAME BOARD AND MOVABLE BALL AND RINGS

Jose Luis Pemjean Mazuela, 5 Jalan Labat Daun, Singapore 28, Singapore

Filed May 5, 1972, Ser. No. 250,787
Int. Cl. A63f *7/04, 7/16*
U.S. Cl. 273—109 **6 Claims**

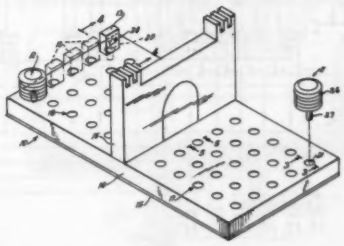


A game of skill employs a flat game board surface into which one or more marbles and one or more posts are imbedded. A ball is rolled along the surface by tilting the board. One or more rings is provided with an inner diameter smaller than the ball but approximately the same size or slightly larger than the marble. The object of the game is to first place the ring onto the ball by moving the ball so as to drive the ring against a post and thereby flip the ring over onto the ball. The ring must then be flipped onto the marble by impacting the ball against the marble.

3,752,481
PNEUMATIC BOARD GAME APPARATUS

Norman Fabricant, 94-19 64th Rd., Rego Park, N.Y.

Filed Mar. 3, 1972, Ser. No. 231,644
Int. Cl. A63f *3/00*
U.S. Cl. 273—131 BA **7 Claims**



A toy including a playing board having two groups of holes in its top face and supporting a partition which prevents each player from seeing his opponent's group of holes. An air channel interconnects each hole of one group with only one hole of

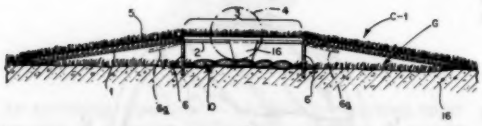
the other group. Each player is furnished with a set of playing pieces, fewer in number than the number of holes in his group, and a pump means. Each playing piece has an extension which can be slidably accommodated in any of the holes, and each pump means has a nozzle which can be accommodated in any of the holes. Thus, if a playing piece is engaged with a hole in the first group, the pump nozzle is engaged with a hole in the second group, and the engaged holes are connected by a channel, operation of the pump means causes an impulse of air to travel through the channel and the playing piece is ejected from the board. The pump means may be a bellows. The air channels may be created by forming the board of two layers, the top layer having grooves in its lower surface which are closed by a bottom layer.

3,752,482

GOLF GAME EQUIPMENT

Ralph Cassel, Meng Rd., R.D. No. 2, Schwenksville, Pa.

Filed Apr. 12, 1972, Ser. No. 243,338
Int. Cl. A63b 67/02, 57/00
U.S. Cl. 273—176 B **5 Claims**



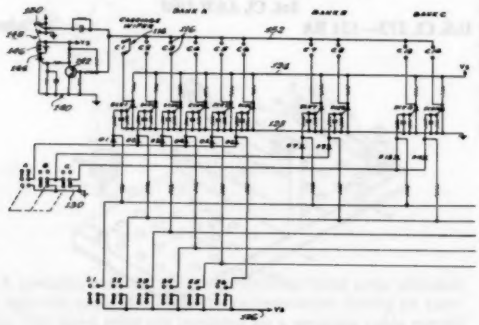
A plurality of simulated cups are placed over an area and spaced away from one another in some desired pattern. A conventional club is used to putt and chip a golf ball successively from cup to cup. A plurality of ball directors are placed respectively adjacent the cups. The directors are numbered successively and are pointed toward the next cup to receive the ball. Each cup includes a deformable, non-elastic pad in the form of fabric tubes sewed together and filled with sand to minimize the possibility of ball jump out. Each cup is formed in a frusto-conical shape and the upper surface of the cup includes a plastic layer simulating close-cropped grass.

3,752,483

TAPE CASSETTE CHANGER SYSTEM

William E. Olliges, Chicago; Edward L. Polanek, Glendale Heights, and Robert Gurney, Chicago, all of Ill., assignors to Universal Research Laboratories, Incorporated, Elk Grove Village, Ill.

Filed Sept. 25, 1970, Ser. No. 75,359
Int. Cl. G11b 23/12
U.S. Cl. 274—4 F **7 Claims**



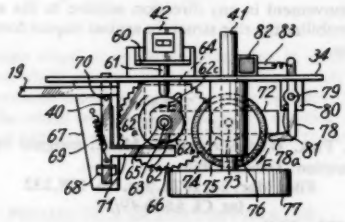
A tape cassette playing system using a magazine holding a number of cassettes is provided, in which a tape playing carriage moves along tracks adjacent the magazine to hunt for a selected one or more of the number of cassettes. The system has a memory to store information as to the selected cassettes. When a first selected cassette is found, it is automatically removed from the magazine and moved laterally into the carriage for playing. After the first cassette has been played, it is automatically returned to the magazine and the carriage hunts for another selected cassette.

3,752,484

MAGNETIC TAPE CARTRIDGE PLAY CONTROL MEANS

Itsuki Ban, 829 Higashi-Oizumimachi, Tokyo, Japan

Filed Sept. 28, 1970, Ser. No. 75,876
Claims priority, application Japan, Sept. 26, 1969, 44/76237
Int. Cl. G11b 21/12, 23/12
U.S. Cl. 274—4 F **5 Claims**



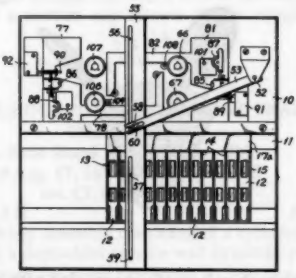
In a magnetic tape player utilizing a plurality of endless magnetic cartridges which is capable of playing the cartridges in such a successive manner that the next cartridge is automatically brought to the play position upon completion of the preceding cartridge held in the play position, magnetic tape cartridge play control means comprises a movable deck to which a rotatable capstan for playing the cartridge in the play position is mounted, a latch lever for retaining the deck in the reproducing position where the cartridge is engaged thereby in the play position, and an actuating member for moving the latch lever to the position establishing disengagement from the deck in response to completion of the cartridge in the play position thereby allowing the deck to be retracted from the reproducing position, whereby the next cartridge is brought to the play position in response to retraction of the deck from the reproducing position, and the play of the cartridge is initiated by return movement of the deck to the reproducing position.

3,752,485

AUTOMATIC AND CONTINUOUS CASSETTE PLAYER

Katsuhiko Okabe, Tokorozawa, Japan, assignor to Victor Company of Japan, Ltd., Yokohama City, Japan

Filed Apr. 23, 1970, Ser. No. 31,153
Claims priority, application Japan, Apr. 28, 1969, 44/32924; Apr. 28, 1969, 44/39036
Int. Cl. G11b 23/12
U.S. Cl. 274—4 F **2 Claims**



An apparatus for playing a plurality of cassettes automatically and continuously in sequence. The apparatus plays a cas-

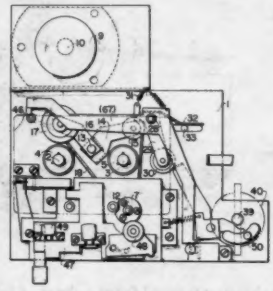
sette taken out from a sequentially fed cassette case; and both forward and reverse channel tracks of a two track tape of each cassette are put to reproducing performance to play.

3,752,486

CASSETTE-TYPE MAGNETIC TAPE RECORDING AND REPRODUCING APPARATUS

Kinya Nakamura, Saitama-ken, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma-shi, Osaka, Japan

Division of Ser. No. 780,645, Dec. 3, 1968, Pat. No. 3,632,113.
This application May 4, 1971, Ser. No. 140,233
Claims priority, application Japan, Mar. 14, 1968, 43/17084; Mar. 14, 1968, 43/17085 (Utility Model); Mar. 14, 1968, 43/20547 (Utility Model); Mar. 14, 1968, 43/20548 (Utility Model); Mar. 14, 1968, 43/20549 (Utility Model); Mar. 14, 1968, 43/20550 (Utility Model)
Int. Cl. G11b *15/04*
U.S. Cl. 274—4 C **2 Claims**



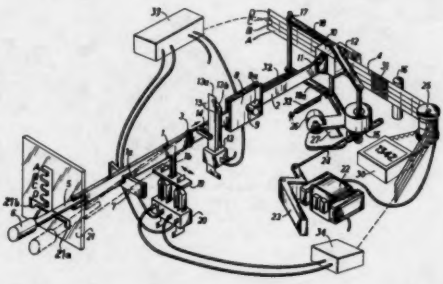
Apparatus to prevent inadvertent recording over a prerecorded tape in a cassette, comprising: a pivotally mounted L-shaped member having a projection for detecting the presence or absence of an opening in a cassette, which opening indicates the presence of a prerecorded tape therein; a blocking projection provided at the other end of the detecting lever and engaging a mechanical record mode actuating lever to block the movement of the record mode lever when the presence of a prerecorded tape is detected; and a record operation mode hold lever pivotally mounted for movement by the record mode lever to engage a pin on an operating mode change-over cammed member so as to hold the apparatus in the record mode when a prerecorded tape is not detected.

3,752,487

TAPE RECORDER CONTROLLING DEVICE

Guy Etienne de La Celle, 6, rue Marengo, Bordeaux, France

Filed Mar. 4, 1971, Ser. No. 120,999
Claims priority, application France, Mar. 9, 1970, 7008368
Int. Cl. G11b *5/54*
U.S. Cl. 274—4 A **15 Claims**



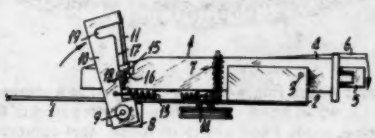
A single operating member for controlling tape recorders of the type having slow forward movement of the tape for reproducing or recording, fast forward movement of the type, and fast rewinding of the tape. The operating member comprises two portions pivotally connected to each other. One portion supports the magnetic head. In its rest position the magnetic head is spaced from the tape which may have a plurality of recording tracks. By pushing in the operating member the magnetic head is brought into engagement with the tape and a switch operatively connected to the operating member effects the movement of the tape at a slow forward speed. Fast forward and rewinding movement of the tape are effected by rotating the portion of the operating member remote from the magnetic head to one side and the other of a central rest position. In the fast forward or rewinding positions, the magnetic head can not be brought into contact with the tape. A vertical movement of the operating member enables the magnetic head to be brought into operative engagement with the various tracks of the tape. The operating member is locked in the recording or reproducing position and is released by the energization of an electromagnet by means of conductive segments on the tape.

3,752,488

CASSETTE TAPE READ OUT DEVICES

Nardino Righi, via Maniago, 2, Milan, Italy

Filed Apr. 9, 1971, Ser. No. 132,669
Claims priority, application Italy, Apr. 14, 1971, 23275 A/70
Int. Cl. G11b *5/86*
U.S. Cl. 274—4 E **3 Claims**



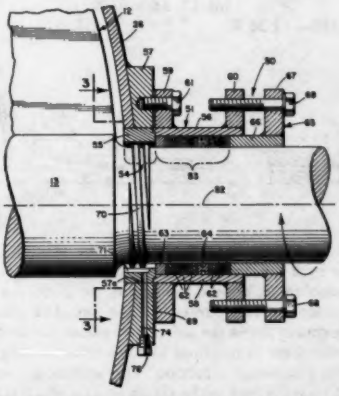
A cassette tape read out device comprising a cartridge support frame which may be rotated by a slight downward manual pressure to the removal position for a previously inserted cartridge; the device also comprising a spring-biased hooking swinging member, serving to stop the frame in its operating positions.

3,752,489

SELF-FLUSHING SHAFT SEAL

George A. Latinen, deceased, late of Springfield, Mass. (by May V. Latinen, administratrix), assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 16, 1971, Ser. No. 172,061
Int. Cl. F16j *15/54*
U.S. Cl. 277—64 **3 Claims**



Described herein is an assembly whereby a shaft seal employing a viscoseal-type sealing screw is self flush cooling with

the same process liquid used to establish, in combination with such screw, the desired seal. The seal is functional under variable differential pressure conditions. For operating conditions when the shaft in the vicinity of the seal is not immersed in process liquid, a coacting second, or back up, seal is provided to prevent loss of pressure in the region of the process liquid.

3,752,490

ELASTIC PISTON RINGS AND METHOD FOR THEIR MANUFACTURE

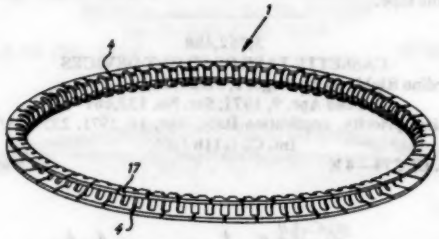
Robert Geffroy, Neuilly-sur-Seine, France, assignor to Societe de Mecanique de Pringy, Pringy (Haute-Savoie), France

Division of Ser. No. 653,742, July 17, 1967, Pat. No. 3,586,544. This application June 29, 1970, Ser. No. 60,167

Claims priority, application France, July 20, 1966, 6670156; July 20, 1966, 6670157

Int. Cl. F16j 9/20

U.S. Cl. 277—140 **7 Claims**



An elastic piston ring, generally employed as a scraper ring and also known as an oil control ring, of spring steel of the U-section type, made from a strip of rolled steel comprising a grooved web and flanges cut-out in alternate folded portions so as to have a cross-section of U-shape, the said band being then cut into lengths which are rolled to the shape of a ring, the final lateral surfaces of the said piston ring each constituted by the successive sections of each flange being obtained by flow of the metal in an appropriate tool, by an operation known as forging, without other machining action on the said surfaces and a method for its manufacture.

3,752,491

SAFETY SKI BINDING SYSTEM

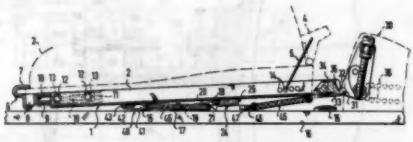
Fritz M. Fend, Regensburg, Germany, assignor to Hannes Marker, Garmisch-Partenkirchen, Germany

Filed June 8, 1971, Ser. No. 150,974

Claims priority, application Germany, June 23, 1970, P 20 31 018.3

Int. Cl. A63c 9/00

U.S. Cl. 280—11.35 K **7 Claims**



A connection between the ski and the skiing boot is provided for by a separate soleplate. A plate-holding device engages the soleplate behind the heel of the boot. An abutment for the soleplate is mounted on the ski. The plate-holding device normally urges the soleplate against the abutment and releases the same in response to an overload acting in a vertical and/or horizontal direction. The abutment consists of a lever, which is pivoted to the ski on an axis which is transverse to the longitudinal direction of the ski. Said lever has a free end portion extending toward the rear end of the ski. A disc is provided on the underside of the soleplate and is adapted to be approximately coaxial to the tibia of the skier and bears on the free end portion of the lever. At least two bearing blocks are secured to the ski below the soleplate and support the soleplate before and behind the disc. The plate-holding device comprises a known, spring-loaded detent member, which engages a wedge-shaped notch at the rear end of the soleplate. The apex of said notch is rearwardly and downwardly inclined.

3,752,492

TOBOGGAN

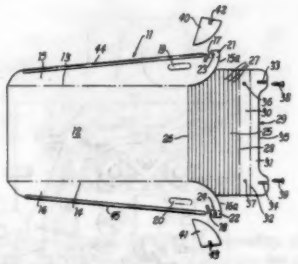
Derek Davies, 17-19 W. Ferry Rd., London E.14, England

Filed Oct. 12, 1971, Ser. No. 188,177

Claims priority, application Great Britain, Oct. 12, 1970, 48,457/70

Int. Cl. B62b 15/00

U.S. Cl. 280—18 **12 Claims**



A snow toboggan formed from a sheet of foldable water resistant material, preferably a synthetic plastics material by cutting scoring and folding a blank. The toboggan comprises a flat base, two upstanding side walls joined to the base along fold lines and a front wall which is also joined to the base along a transverse fold line and which bears against the outwardly and forwardly inclined front edges of the side wall. A flap is joined along a fold line to the upper edge of the front wall along a fold line and the flap is folded rearwardly and downwardly so as to interengage with the side walls. Preferably the side walls and the flap are slotted and the interengagement of the slots retains the side walls in the upright position. Additional retaining means in the form of lugs on the side walls which are secured to the flap can also be provided.

3,752,493

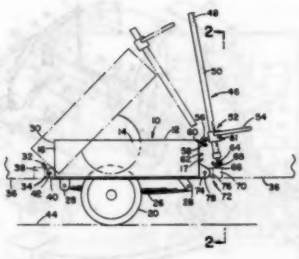
RETRACTABLE AND DETACHABLE WHEEL ASSEMBLY

Hillman M. McWhorter, 2311-A Starmount Cir., Huntsville, Ala.

Filed Jan. 25, 1971, Ser. No. 109,189

Int. Cl. B62d 21/18

U.S. Cl. 280—43.21 **4 Claims**



A wheel assembly for use with transportable structures such as trailers, mobile homes and prefabricated buildings consisting of a wheel or wheels conventionally supported between

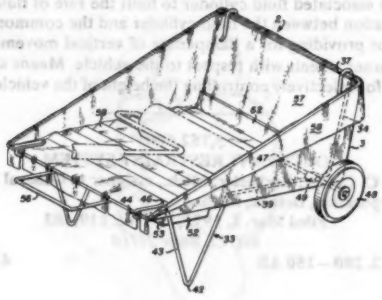
longitudinal beams of a rectangular frame and wherein one end beam of the frame is detachably and rotatably mounted to the structure it supports and the opposite end beam is detachably connected to the frame of the structure through a jack which is operable to lower the wheel assembly to carry the structure during transit and to raise the wheel assembly causing the structure to be lowered on a fixed support at its destination.

3,752,494

PAINT CART ASSEMBLY AND METHOD OF FABRICATION

Kirkley J. Dunn, 1473 Merry Ln., San Jose, Calif.

Filed July 12, 1971, Ser. No. 161,592
Int. Cl. B62b *1/20*
U.S. Cl. 280—47.26 **8 Claims**



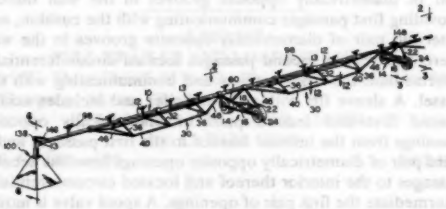
Presented is a paint cart assembly and a method of fabrication of the paint cart which reduces the initial cost of fabrication and assembly and when assembled, provides a disposable liner which precludes the necessity for cleanup of the paint cart after use.

3,752,495

IRRIGATION CARRIAGE

Warren N. Ross, 2123 N. First St., Hermiston, Oreg.

Division of Ser. No. 836,739, June 26, 1969, abandoned. This application Feb. 25, 1971, Ser. No. 119,023
Int. Cl. B60p *3/30*; B60b *35/10*
U.S. Cl. 280—80 R **2 Claims**



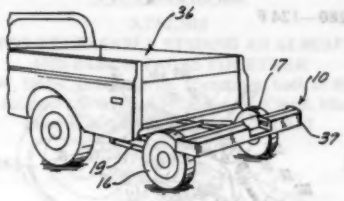
An irrigation line move has a pipe supported by carriages with flexible, tapered trusses below the pipe extending between the carriages with the central portions of the trusses rotatable on and slidable along the pipe. Control boxes over the carriages mount switches which are actuated by bars attached to the pipe to stop the carriages when excessive misalignment is approached. A center pivot water supply device has a flushing exit, and a slip ring connector for electrical power to electric motor drives of the carriages. The carriages have adjustable wheel supports to provide toe-in.

3,752,496

AXLE ASSEMBLY FOR VEHICLES

Clarence A. Meinecke, Jr., P.O. Box 162, Gowrie, Iowa

Filed Aug. 9, 1971, Ser. No. 170,160
Int. Cl. B60s *9/18*
U.S. Cl. 280—81 R **3 Claims**



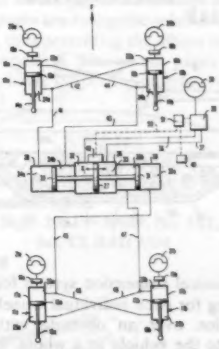
An axle assembly attachable to a vehicle such as a pickup truck to supplement the load-carrying capacity of the vehicle and to stabilize the ride. The assembly extends from the rear of the vehicle and includes a pair of wheels adjustably mounted to a supporting frame. The wheels may be raised out of ground engagement or lowered to provide varying degrees of load support by action of a jacking means carried by the supporting frame and capable of rotating a torque-transmitting member connected to the axle through motion-dampeners. A vehicle bumper is removably attached to the rear of the assembly, and the entire assembly is pinned to mounting brackets secured to a vehicle frame.

3,752,497

INSTALLATION FOR STABILIZING THE VEHICLE BODY AGAINST CURVE-TILTING

Kurt Enke, Kirchheim/Teck; Klaus Bauer, Stuttgart-Heumaden, and Udo Saftien, Waiblingen, all of Germany, assignors to Daimler-Benz AG, Stuttgart, Germany

Filed Sept. 28, 1971, Ser. No. 184,569
Claims priority, application Germany, Oct. 1, 1970, P 20 48 323.3
Int. Cl. B60g *17/04*
U.S. Cl. 280—112 A **20 Claims**

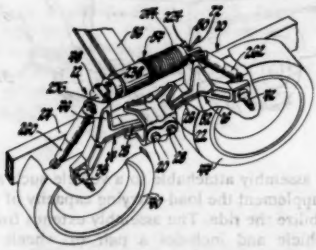


An installation for stabilizing the vehicle body against curve-tilting, in which an erecting force is exerted on the side of the vehicle body disposed on the outside of the curve, whereby a pressure medium is supplied in dependence on the curve drive of the vehicle directly to the pistons of cylinder-piston units connected between the wheels and the vehicle body in such a manner that the cylinder-piston unit associated with the wheel on the inside of the curve is shortened in the sense of a lowering of the vehicle body and the cylinder-piston unit associated with the wheel on the outside of the curve is lengthened in the sense of a lifting of the vehicle body.

3,752,498
OLEO-PNEUMATIC SUSPENSION ASSEMBLY

James M. Shea; Claude A. Thorsby, and Kenneth L. Westercamp, all of Saginaw, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 7, 1971, Ser. No. 187,415
Int. Cl. B60g 17/04
U.S. Cl. 280—124 F 5 Claims

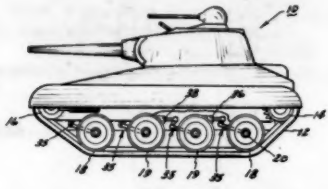


In preferred form, a vehicle suspension device including a gas spring formed in part by an oil-filled, variable volume oil reservoir for a shock absorber. The device includes a hollow piston that reciprocates into and out of a shock absorber pressure cylinder in response to normal road movements. A spool divides the hollow piston into an oil charging chamber and an oil pressure chamber and the oil pressure chamber is connected to an external source of oil pressure which is selectively communicated with the inner cylinder to change the position of the spool axially therein thereby to change the amount of oil within the oil filled reservoir of the shock absorber to change the gas spring pressure in accordance with changes of vehicle loading thereby to maintain a predetermined height relationship between the sprung and unsprung mass of the vehicle.

3,752,499
FLUID-MECHANICAL SUSPENSION SYSTEM

Jack M. Brandstadter, 1904 Cresthill, Royal Oak, Mich.

Filed Apr. 26, 1971, Ser. No. 137,508
Int. Cl. B60g 17/08
U.S. Cl. 280—124 F 19 Claims



A fluid-mechanical suspension system for a multi-wheeled vehicle providing for each individual wheel to be capable of upward deflection over an obstacle without imparting a similar motion to the vehicle as a whole. Each wheel of the vehicle is carried by a support arm pivotally mounted on the vehicle by way of a spindle journalled in an appropriate bearing to permit a defined amount of vertical displacement of the wheel with respect to the vehicle. A fluid cylinder having a reciprocable piston is actuated by a connecting rod pivotably connected to a crank arm projecting radially from the support arm spindle, such that the volume of the fluid in the cylinder is decreased by an upward vertical displacement of the wheel with respect to the vehicle and increased by a downward vertical displacement of the wheel. Each fluid cylinder is connected to a common source of system pressure, such as a control accumulator, such that each fluid cylinder and its associated mechanical transmission provides a positive rate of change in the vertical force with a corresponding change in wheel displacement. The support arm and the crank arm are angularly mounted on the spindle relatively to each other and to the horizontal, and their effective lengths are such that they form a non-linear variable ratio mechanical transmission or coupling means between the road wheel and the fluid cylinder.

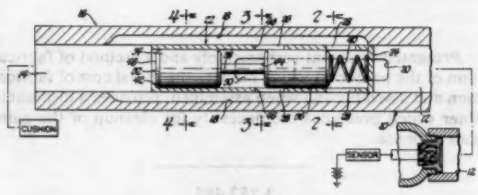
A second embodiment of the present invention is disclosed as employing a rotary displacement mechanism in place of the fluid cylinder.

In one example of the present invention the fluid-mechanical suspension system is in the form of a plurality of wheels mounted on both sides of a vehicle with the fluid cylinders associated with each wheel being interconnected with one another and a central common accumulator such that the pressure of the fluid in any one of the cylinders is a function of the volume of fluid in the accumulator. The fluid cylinders associated with the corner wheels of the vehicle are preferably provided with a valving mechanism that is operable upon a predetermined pressure differential between the accumulator and its associated fluid cylinder to limit the rate of fluid communication between the fluid cylinder and the common accumulator providing for a dampening of vertical movements of the corner wheels with respect to the vehicle. Means are provided for selectively controlling the height of the vehicle.

3,752,500
OCCUPANT RESTRAINT SYSTEM

Clyde C. Culver, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 1, 1971, Ser. No. 119,483
Int. Cl. B60r 21/10
U.S. Cl. 280—150 AB 4 Claims



An occupant restraint system includes a vessel sealed by a rupturable diaphragm and providing a source of pressure fluid. The outlet of the vessel communicates with an inflatable cushion. A variable area orifice device controls the pressure fluid flow between the vessel and the cushion in accordance with the intensity of the acceleration pulse applied to the vehicle. The device includes an elongated cylinder having a first pair of diametrically opposite grooves in the wall thereof providing first passages communicating with the cushion, and a second pair of diametrically opposite grooves in the wall thereof providing second passages located circumferentially intermediate the first passages and communicating with the vessel. A sleeve fits within the cylinder and includes axially spaced first and second pairs of diametrically opposite openings from the interior thereof to the first passages and a third pair of diametrically opposite openings from the second passages to the interior thereof and located circumferentially intermediate the first pair of openings. A spool valve is movable within the sleeve and has one land engaging a fixed stop under a compression spring seating against the other land to locate the valve in unactuated position. In this position the first and third pairs of openings open to the space between the adjacent ends of the lands. The adjacent end of the other land partially closes the first pair of openings to provide a variable area orifice between the interior of the sleeve and the first passages communicating with the cushion. The second pair of openings open to the remote end of the other land, and the first passages open to the remote end of the one land. When an acceleration pulse of predetermined amplitude and time is received by the vehicle, the diaphragm is ruptured and the

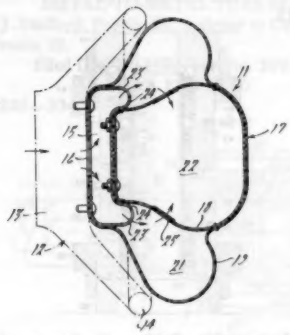
pressure fluid released for flow into the second passages and thence through the third pair of openings to the interior of the sleeve between the lands. The fluid then flows outwardly of the sleeve through the variable area orifice to first passages for flow to the cushion. The acceleration pulse is likewise applied to the valve spool and the other land moves axially of the sleeve to set the area of the orifice. The area of the orifice is dependent on the intensity of the pulse. The second pair of openings provides for flow of the pressure fluid from the first passages to the remote end of the other land so that the pressure on the adjacent and remote ends of both lands is equal.

3,752,501

STEERING WHEEL INFLATABLE CUSHION DEVICE

Roger P. Daniel, Dearborn, and Alex Rhodes, Detroit, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 20, 1971, Ser. No. 190,846
Int. Cl. B60r *21/10*
U.S. Cl. 280—150 AB **14 Claims**



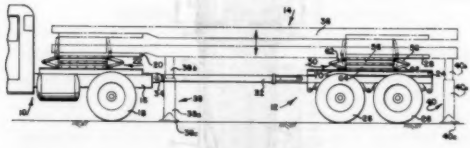
An inflatable cushion device for protective interposition between a vehicle operator and the rim and hub of a vehicle steering wheel assembly. The cushion is compartmented to provide, when inflated, peripheral ring compartmentation in juxtaposition to the steering wheel rim and center compartmentation in overlying juxtaposition to the steering wheel hub. The peripheral ring compartmentation when pressurized provides greater resistance to collapse than the center compartmentation, whereby the peripheral ring compartmentation is adapted to guide the vehicle operator upon contact of the latter with the cushion toward the center compartmentation thereby to maintain the vehicle operator in substantially centered cushioned relationship to the steering wheel assembly under vehicle impact conditions.

3,752,502

PULL TRAILER AND LOAD LIFT MEANS

Carl W. Ehler, Deerfield Beach, Fla., assignor to Oehler Steel Company, Akron, Ohio

Filed Jan. 28, 1971, Ser. No. 110,486
Int. Cl. B62d *53/00*
U.S. Cl. 280—440 **5 Claims**



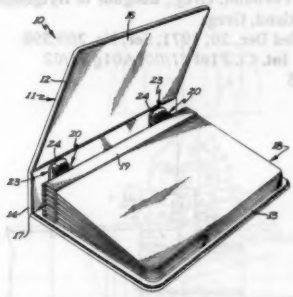
A load supporting and lifting means for a pallet load carrying tractor-trailer assembly. The load bearing plates are supported at the upper ends of an inflatable air bag with a lower end of the bag being supported on the truck or trailer frame. Hinge load carrying plates also connect the edges of the load bearing plates to the frame of the truck or trailer. Breaking cylinders are connected between the hinge plates and the base frame to aid in load release action. The hinge plates are substantially vertically directed when operative and carry a substantial portion of the weight and stabilize the load when it has been lifted by the inflated air bag.

3,752,503

MEANS FOR RELEASABLY BINDING AN ALBUM COVER AND ALBUM PAGES TOGETHER

William W. Holes, and Roger A. Wenstrom, both of St. Cloud, Minn., assignors to William W. Holes, St. Cloud, Minn.

Filed June 10, 1971, Ser. No. 151,832
Int. Cl. B42d *3/00*
U.S. Cl. 281—17 **3 Claims**



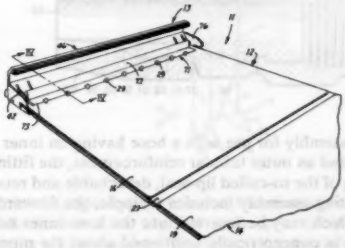
An album comprises a front cover, rear cover, a back member connected to the front and rear covers, a plurality of album pages each having hinge elements thereon, and a pair of hinge supporting members on the inner surface of the back member. Each of the album pages has means thereon which define a pair of hinge elements that releasably engage the hinge supporting members. The hinge supporting members are each comprised of a base having a plurality of hinge engaging elements integrally formed therewith and projecting outwardly from one surface thereof. The hinge engaging elements of each supporting member have an enlarged end, thus permitting the hinge elements of each page to be inserted between a plurality of the hinge retaining elements so as to releasably lock the album pages to the hinge supporting members. The album pages are swingable relative to the hinge supporting members, thus permitting the album to be opened into completely flat condition. The album pages may be readily removed from the hinge supporting members or may be added thereto, as desired.

3,752,504

SHEET HOLDER

Allen L. Dixon, Portage, Mich., assignor to Master-Craft Corporation, Kalamazoo, Mich.

Filed Sept. 20, 1971, Ser. No. 181,798
Int. Cl. B41l *3/04*
U.S. Cl. 282—29 B **10 Claims**



An improved sheet holder having a substantially rigid base plate and a clamping member hingedly connected to the base

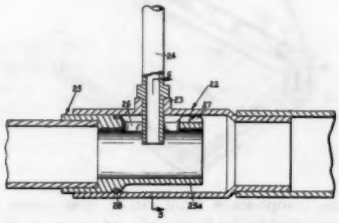
plate along one edge thereof for clamping engagement with one edge of a sheet for securely maintaining same in position adjacent the upper surface of the base plate. A substantially channel-shaped hinge member is fixedly secured to the base plate and extends into substantially parallel slots formed in the clamping member for permitting relative pivotal movement therebetween. A leaf spring is disposed between the legs of the hinge member and is positioned to resiliently urge the clamping member toward an open or closed position. The hinge assembly, including the spring, is substantially hidden by the clamping member, even when in the open position.

3,752,505

SPIGOT MEMBER FOR BELL AND SPIGOT JOINT IN IRRIGATION PIPE

John C. Stout, Portland, Oreg., assignor to Irrigation Accessories Co., Portland, Oreg.

Filed Dec. 20, 1971, Ser. No. 209,598
Int. Cl. F16l *41/00*; A01g *25/02*
U.S. Cl. 285—5 **1 Claim**



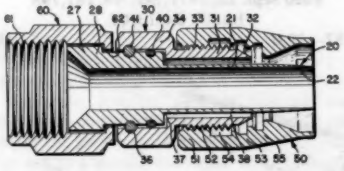
The spigot member of the bell and spigot assembly has an end portion of reduced external and internal diameter which extends into the bell from a water seal connection with the bell member, and is so arranged as to provide annular clearance space between the spigot and surrounding bell wall in order to prevent grit particles lodging between spigot and bell and hindering free relative longitudinal movement of spigot and bell with respect to each other, or causing excessive wear from such movement. The tip end of the reduced portion of the spigot has elements in sliding engagement with the interior wall of the bell for maintaining spigot and bell in axial alignment and for maintaining said annular clearance space.

3,752,506

SEALED FITTING FOR REINFORCED HOSE

Robert E. Fouts, 14611 Hawthorne Blvd., Lawndale, Calif.

Filed Sept. 18, 1972, Ser. No. 289,793
Int. Cl. F16l *39/02*
U.S. Cl. 285—149 **6 Claims**



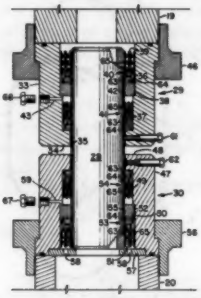
A fitting assembly for use with a hose having an inner fluid sealing tube and an outer tubular reinforcement, the fitting assembly being of the so-called lip-seal, detachable and reusable type. The fitting assembly includes a nipple, the forward end portion of which may be inserted into the hose inner tube, a sleeve which is concentrically positioned about the nipple so as to define an annular space therewith in which a portion of the inner tube of the hose is forced during assembly, and a socket which is threadably received on the sleeve and which defines a second annular space between the sleeve and the internal surface of the socket, the socket also including means for gripping the end of the hose during assembly so that axial movement of the socket relative to the sleeve forces a portion of the hose inner tube and the outer reinforcement into the second annular space. When fully assembled, the nipple may be rotated relative to the sleeve, hose, and socket so that if the nipple is attached to an albow connection and the opposite end of the hose cannot be rotated, the elbow may be rotated without affecting the seal. The embodiments disclosed are particularly adapted for use with types of hose, such as Mil. Spec. H 58089, which are relatively flexible.

3,752,507

SWIVEL

William C. Maurer; James F. Miller, and Ira D. Hickman, all of Houston, Tex., assignors to Esso Production Research Company, Houston, Tex.

Filed Oct. 1, 1971, Ser. No. 185,625
Int. Cl. F16l *17/02*
U.S. Cl. 285—12 **8 Claims**



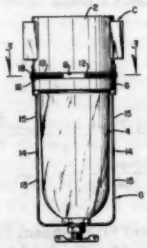
Two relatively rotatable, fluid conducting members of a swivel are interconnected by an improved assembly which includes a washpipe, mounting sleeves for connecting opposite ends of the washpipe to the fluid conducting members, and a tandem packing arrangement in at least one of the sleeves. A port formed in the sleeve containing the tandem packing arrangement communicates with the axial space separating the packings. Means are also provided for selectively locking each sleeve to the washpipe so that the packing in either sleeve can be made to function as a static seal or a dynamic seal depending on the position of the locking means. The improved washpipe assembly in one embodiment permits the swivel to be operated through two stages, and in another embodiment, through three stages before the packing must be replaced.

3,752,508

BOWL GUARD CONNECTOR

Delbert G. Faust, Denver, Colo., assignor to C. A. Norgren Co., Littleton, Colo.

Filed Feb. 22, 1972, Ser. No. 227,989
Int. Cl. F16l *37/00*
U.S. Cl. 285—307 **9 Claims**



A connector for joining a bowl guard to the housing of a fluid control component which is very simple to use and which

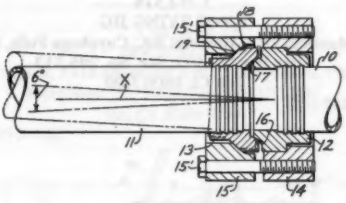
permits the use of easily fabricated parts is disclosed. The fluid control component includes a housing with a depending flange to which a plastic or glass bowl is attached, the flange having a peripheral groove therein. The bowl guard has a peripheral lip with a groove that is alignable with the groove of the housing to form an annular recess when the lip of the bowl guard is placed over the flange of the housing in telescopic relationship. A flexible resilient elongated connector, such as a coil spring, having a cross-sectional area substantially corresponding to that of the annular recess is insertable through a notch in the lip into the annular recess and the protrusions of the coil spring are engageable with transverse ribs in the housing groove to hold the connector upon rotation of the bowl guard with respect to the housing. The groove of the bowl guard moves longitudinally therealong until the connector is enclosed within the annular recess after approximately one revolution of the bowl guard to prevent separation of the bowl guard from the housing due to shear forces.

3,752,509

METAL-TO-METAL TUBE SEAL

Warren J. Stafford, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 20, 1971, Ser. No. 209,944
Int. Cl. F16l 17/00
U.S. Cl. 285—334.4 **14 Claims**



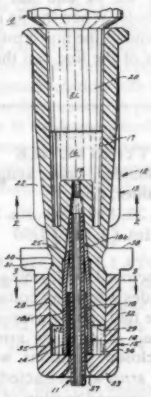
Two axially aligned tubes have clamped, annular sealing members mounted thereon to define convex and spherical surfaces maintained in line sealing contact.

3,752,510

STRUCTURE FOR CONNECTING A FLEXIBLE TUBE TO A SYRINGE

Edward F. Windischman, Daytona Beach, Fla.; John M. Chambers, Manchester, Mo., and Howard E. Werner, Deland, Fla., assignors to Sherwood Medical Industries, Inc., St. Louis, Mo.

Filed Oct. 7, 1971, Ser. No. 187,471
Int. Cl. F16l 25/00
U.S. Cl. 285—334.4 **8 Claims**



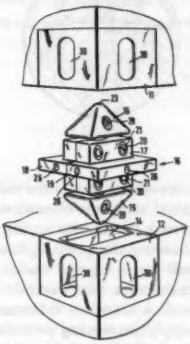
A connector structure for connecting a flexible tube end to a syringe having a luer tip including a plastic hub having a bore therethrough and connected to the tip, a retainer in the hub bore for retaining the tube end therein, and a plastic bushing arranged to constrict the retainer about the tube end to effect sealed frictional retention of the tube in the hub. A construction is disclosed in which the retainer and tube end are urged into a tapered bore portion of the hub bore by the bushing, and another construction in which the bushing constricts a hub portion about the retainer and tube.

3,752,511

CONTAINER COUPLER

Stanley Racy, Valley Stream, N.Y., assignor to Line Fast Corporation, Farmingdale, N.Y.

Filed June 4, 1971, Ser. No. 150,058
Int. Cl. F16b 7/00
U.S. Cl. 287—2 **5 Claims**



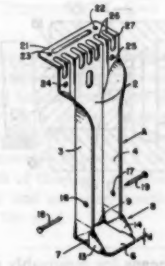
This invention pertains to a container coupler having a housing which acts as a spacing means and in which is journalled for rotation a locking element. The locking element is provided with tapered elongated heads at each end thereof for engagement within the standard corner fitting of a freight container. The locking element is provided with offset bosses intermediate the ends thereof which are manipulatable to lock and unlock the container coupler.

3,752,512

SINGLE-THICKNESS SEAT HANGER

Tyrell T. Gilb, San Leandro, Calif., assignor to Simpson Company, San Leandro, Calif.

Filed Jan. 24, 1972, Ser. No. 220,041
Int. Cl. F16b 5/00
U.S. Cl. 287—20.94 **1 Claim**



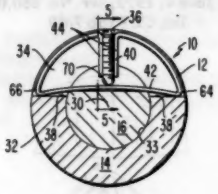
A metal hanger for use in wood frame construction adapted for attachment to a support such as a carrying beam for receiving a joist member. The hanger consists of a back, a pair of sides, a seat and a uniquely folded connecting area connecting the sides and the seat. The seat consists of a single thickness of material and the distance between the bottom of

the joist and the bottom of the hanger constitutes no more than a single thickness of said material.

3,752,513
SELF-CENTERING SHAFT LOCKING KEY

Dewey M. Sims, Jr., Westland, and Franklin H. Price, Jr., Troy, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Aug. 26, 1971, Ser. No. 175,172
Int. Cl. F16d 1/06
U.S. Cl. 287—52.08 **13 Claims**

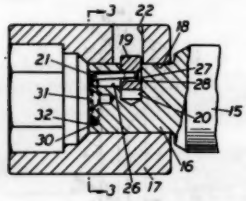


A locking device serving as a key for securing an annular member or hub against axial movement on a shaft and for repetitively self-returning the hub to an angular preset condition and thereafter holding the same against rotation relative to the shaft. The hub has a tapped radial hole through the center of which a transverse slot extends and in which the locking key is received. A set screw is threadedly advanced in the tapped hole to apply increasing pressure on the midportion of the locking key so that spaced parts of the key will contact the slot floor and a flat surface on the shaft creating moments of force which act in offset relation to the shaft's axis with the result that relative rotation of the shaft and hub will occur until a preset angular or home position is reached at which time the slot floor and the flat of the shaft extend parallel to one another.

3,752,514
SOCKET RETAINING MEANS

Knut Christian Schoeps, Nacka, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Sept. 11, 1970, Ser. No. 71,466
Claims priority, application Sweden, Sept. 26, 1969, 13248/69
Int. Cl. F16d 1/06
U.S. Cl. 287—53 R **10 Claims**

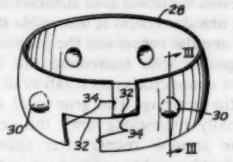


A socket retaining means for removably retaining a socket wrench on the outer polygonal or splined end of a drive shaft includes a releaseable engagement between the socket wrench and means on or forming part of a retaining member. The retaining member is a wire spring with a ring shank riding by clamping action in a ring groove on the tip of the drive shaft and having a rearwardly directed retaining shank applying itself or a detent releasably against the socket wrench.

3,752,515
RESILIENT KEEPER RING

Seibert S. Oaks, Everett, and Ethamore F. Claar, Imler, both of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Filed Sept. 15, 1971, Ser. No. 180,710
Int. Cl. F16d 1/06
U.S. Cl. 287—52 R **3 Claims**

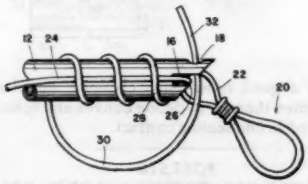


The specification discloses a resilient keeper ring, especially for mounting in the grooved shank of a rotatable tool for retaining the tool in a support block therefor in which the resilient ring is in the form of a split band with the ends of the band in overlapping relation so that the bands can be handled in an automatic feeding device without becoming interlocked with each other.

3,752,516
KNOT TYING JIG

Paul R. Mumma, 2920 Hastings Rd., Cuyahoga Falls, Ohio

Filed Dec. 7, 1971, Ser. No. 205,513
Int. Cl. D03j 3/00
U.S. Cl. 289—17 **5 Claims**



A jig to aid in tying a knot in a line or cord, for example for knotting a fishing line onto a connector means or a hook. The jig is a hollow tubular member with the ends cut at 45° angles and provided with a notch in the cut end and a hole adjacent the notch. In use, the line is laid along the side of the jig, passed through the eye of the fish hook or connector which preferably is laid in the notch, wrapped in several loops, usually three, around the jig and has the end of the line threaded through the hole. When the jig is cleared by slipping the loops off of it, the end of the line is pulled through the convolutions and the ends of the line can then be drawn tight to complete the knot.

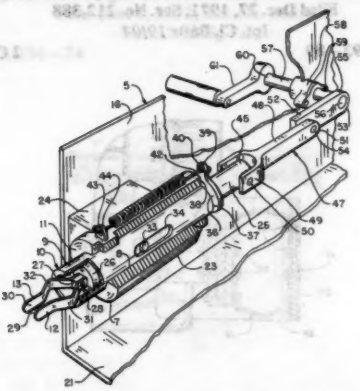
3,752,517
TYING DEVICE

Ralph H. Warmack, Boulder, Colo., assignor to Ball Brothers Research Corp., Boulder, Colo.

Filed Dec. 20, 1971, Ser. No. 209,836
Int. Cl. D03j 3/00
U.S. Cl. 289—17 **17 Claims**

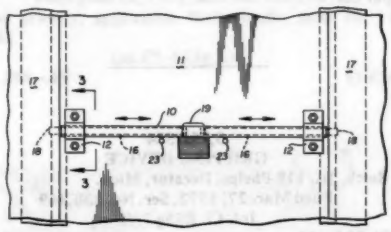
A tying device is disclosed for forming a knot in an article. The tying device includes a forming collar about which a portion of the article to be tied can be wrapped and one end then inserted between a pair of gripping arms that are movable between open and closed positions with respect to one another. The gripping arms are retracted to a position within the collar carrying the gripped portion of the article therewith and the collar is then retracted within a support to dislodge the portion of the article wrapped around the collar therefrom

and thus form a knot. The collar and gripping arms are then extended to permit the tied article to be removed from the



device, the device then being ready to receive and tie a new article.

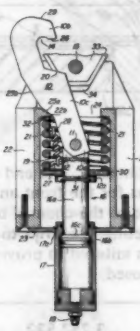
3,752,518
DOOR BOLT
Fred J. Cannell, 2818 Idlewood Ave., Youngstown, Ohio
Filed Sept. 22, 1971, Ser. No. 182,701
Int. Cl. E05c *9/04*
U.S. Cl. 292—42 **3 Claims**



A door bolt for attachment to the inner side of a door to be secured thereby includes a tubular body member having a pair of bars positioned therein for axial movement thereof. Mounting brackets secure the tubular body member to the door and the bars are moveable out of the ends of the tubular member into openings formed in the door casing. Openings formed in the center section of the tubular body member receive the hasp of a padlock between the inner opposed ends of the bars to hold the same in spaced relation with the outer ends engaging the openings in the door casing. A padlock body is applied to the hasp. Openings in the bars inwardly of the ends thereof enable the padlock hasp to be positioned there through when the bars are in innermost engaging position and be held in such position by said hasp and padlock body.

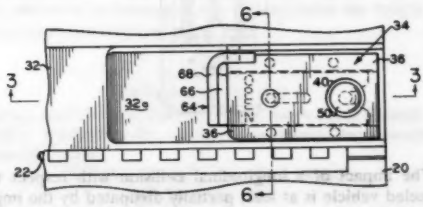
3,752,519
MECHANICAL LATCH
Randy J. Nordell, 735 S. 9th E. St., and Harold C. Kimball, 777E S. Temple 9-B, both of Salt Lake City, Utah
Filed Dec. 2, 1971, Ser. No. 204,138
Int. Cl. E05c *5/04*
U.S. Cl. 292—111 **15 Claims**

A mechanical latch of the type widely utilized to retain, in closed position, an automotive truck cab that is pivoted to be swung open and closed above the truck engine (especially such a cab of the tractor unit of a transport truck-trailer combination) is constructed with its pivoted and axially extendible and retractible, hooked, latch element normally resiliently urged, by a relatively small spring, transversely toward its unlatched position, and is constructed for forced movement into latched position, upon axial retraction of the latch element from its axially extended, unlatched position, by camming means that preferably comprise a camming surface extending along the back of the hooked latch element and bearing, as



such latch element is retracted, against a confronting portion of a housing within and from which the latch element operates. As normally constructed for hydraulic actuation, the relatively powerful spring that returns the power piston and effects latching following longitudinal extension of the latch element to its unlatched position bears against a seating ring that is freely rotatable and independent of, rather than integral with, the clevis element against which such power piston operates and in which the latch element is pivoted.

3,752,520
CONTAINER DOOR LATCH
Walter F. Sprick, and Oscar W. Meller, both of Akron, Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio
Filed Oct. 27, 1971, Ser. No. 201,590
Int. Cl. E05c *1/04*
U.S. Cl. 292—148 **10 Claims**

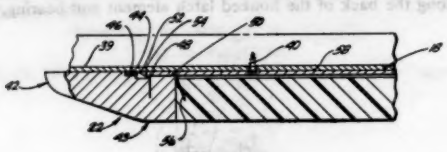


A latch for securing a pair of members in fixed relation relative to one another. One of the members carries a stud which has a frusco-conical head portion and an annular groove. The other member carries a sliding latch plate which has a U-shaped notch at one end. The latch plate is slidably received in a housing and is movable between a closed position in which the U-shaped notch of the latch member engages the annular groove of the stud and an open position in which the latch member is clear of the stud.

3,752,521
PROTECTIVE VEHICLE TRIM STRIP
Adolph Lafebre, 12314 Wicks Ave., Sun Valley, Calif.
Filed Apr. 1, 1971, Ser. No. 130,333
Int. Cl. B60r *19/08*
U.S. Cl. 293—1 **28 Claims**

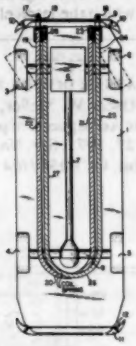
A vehicle trim and protective molding comprising a partially closed channel strip for receiving and retaining a

protruding, resilient strip of material such as weather resistant vinyl. The channel is fastened to the surface to be protected by securing means extending between the base of the channel and the surface. End pieces each having a reduced portion at its interior end are engaged at opposite ends of each channel



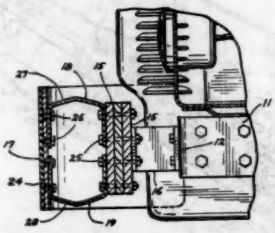
in a telescoping relationship. The end pieces are provided in various configurations for the front and rear of the strip and are physically secured to the channel by catch and detent arrangements or by riveting. On strips to be mounted on doors, the front end piece is mitered to provide clearance when the door is opened and closed.

3,752,522
AUTOMOTIVE VEHICLE IMPACT ENERGY REDUCING BUMPER
Eugene M. Speer, 401 Jennie Jewel Dr., Orlando, Fla.
Filed Nov. 17, 1971, Ser. No. 199,420
Int. Cl. B60r *19/06*
U.S. Cl. 293—60 **14 Claims**



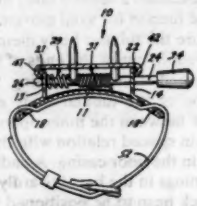
The impact of a longitudinal collision with respect to a wheeled vehicle is at least partially dissipated by the impact object striking projections extending longitudinally beyond the conventional resiliently mounted bumpers so as to drive the impact members longitudinally inwardly for in turn driving energy absorbing means longitudinally generally in a horizontal plane. Particularly, the impact energy absorbing means include at least one coil spring carried within a tube extending from the one end of the vehicle to the opposite end, wherein some embodiments it extends at right angles or is reversely bent to again extend to a terminal end at the one end of the vehicle, so that the impact energy is dissipated in driving the coil spring from the one end to the opposite end, and transversely or in a return path to the one end according to the various embodiments. Fluid expansible chamber shock absorbers may be interposed within the energy absorbing means, the energy absorbing means may redirect the blow in the opposite longitudinal direction back against the impact object, transversely at the opposite end of the vehicle to swing the vehicle away from the impact object, or against an internal resiliently mounted bumper at the opposite end of the vehicle from the impact object.

3,752,523
IMPACT ABSORBING VEHICLE BUMPER
Henry C. Bierbrauer, 7440 Oxford, Minneapolis, Minn.
Filed Dec. 27, 1971, Ser. No. 212,388
Int. Cl. B60r *19/04*
U.S. Cl. 293—89 **2 Claims**



A vehicle bumper having an inner cross beam mounted on the vehicle frame and an outer bumper bar extending parallel to the beam in horizontally spaced relation thereto with the bumper bar end portions angling inwardly beyond the beam in protective positions outside of the vehicle fenders, the bumper bar being mounted on the beam by a plurality of U-shaped metal brackets having their legs respectively bolted to the beam and bar so that the bight portions of the brackets will buckle and absorb the impact of a collision force directed inwardly against the bumper bar. The brackets are independently mounted in pairs spaced apart longitudinally of the bumper bar.

3,752,524
GRIPPING DEVICE
Otto Reick, Jr., 119 Phelps, Decatur, Mich.
Filed Mar. 27, 1972, Ser. No. 238,349
Int. Cl. B65g *7/12*
U.S. Cl. 294—25 **8 Claims**



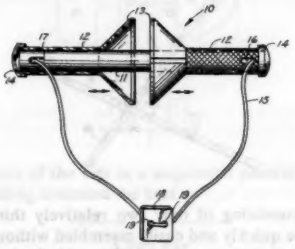
A gripping device having housing means adapted to be attached to the body of a user. Prong means are mounted on the housing means and include support means for supporting the prong means for movement from a retracted stored position in the housing to an extended position of use. Manually operated ejection means are provided which are coupled to the support means for causing the prong means to be ejected from the stored position to the extended position of use wherein the prong means become exposed to grip objects or substances that are normally difficult to grip. The prong means, when in the stored position, are confined and free from snagging on the user's wearing apparel.

3,752,525

DEER DRAGGING AND TAGGING DEVICE

Chester H. Hanna, 331 S. 2nd St., Bellwood, Pa., and Richard A. Igou, 502 Pottsgrove Rd., Altoona, Pa.

Filed Jan. 5, 1972, Ser. No. 215,483
Int. Cl. B65g 7/12
U.S. Cl. 294—74 1 Claim



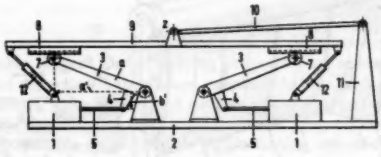
A combination device for tagging and dragging a deer. This device consists primarily of an elongated inner sleeve which will contain a pencil, a deer tag and a pin for holding the tag to the deer's ear. The elongated sleeve is slideable within a pair of flared sleeves with a line and a choker attached.

3,752,526

VEHICLE BED

Gerrit Johan Van Der Burgt, Hoflandstraat 35; Johannes 'T Hart, Vuurdoornlaan 39, both of Pijnacker, and Jacob Schrier, Iependaal 188, Rotterdam, all of Netherlands

Filed June 15, 1971, Ser. No. 153,190
Claims priority, application Netherlands, June 16, 1970, 70/08762
Int. Cl. A61g 3/00
U.S. Cl. 296—19 11 Claims



A vehicle bed comprises a platform for carrying a lying person, e.g. a patient, a maximum shock insulation being contemplated, which is obtained by a mass-spring system for the platform having a very low natural frequency of approximately 0.5 Hz, the platform being fixed against horizontal displacement by fixing means which act in the centre of gravity of the carrier platform loaded with a person.

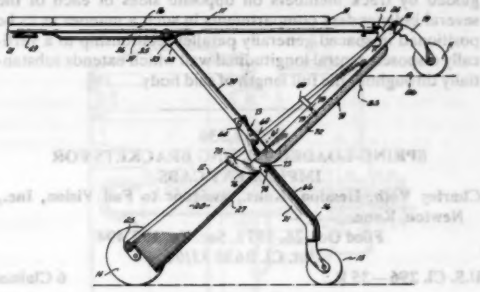
3,752,527

MULTI-LEVER ONE MAN CART ADAPTED TO BE MOVED UP AND DOWN STAIRS

Richard H. Ferneau, Columbus, and Elroy E. Bourgraf, Greenfield, both of Ohio, assignors to Burt Weil, Cincinnati, Ohio

Filed Nov. 18, 1971, Ser. No. 200,138
Int. Cl. A61g 1/02; B62b 3/02
U.S. Cl. 296—20 15 Claims

A cart for transporting articles of merchandise or human bodies comprising a bed supported on four legs having an X-frame configuration, the legs being capable of being angulated with respect to each other to change the level of the bed, one pair of legs being formed in two sections, the lowermost section being pivotable with respect to the upper section to permit it to swing into substantial alignment with the fixed legs to enable an operator to thrust the cart into a vehicle while



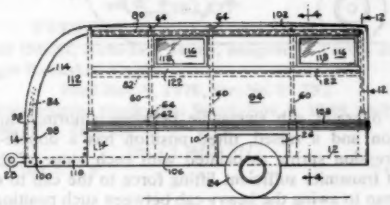
standing at one end of the cart and to enable the operator to move the cart up and down steps while standing at the other end of the cart.

3,752,528

CAMPER

Joseph K. Barker, Rt. 2, Abingdon, Va.

Filed July 21, 1971, Ser. No. 164,737
Int. Cl. B60p 3/34
U.S. Cl. 296—23 R 11 Claims



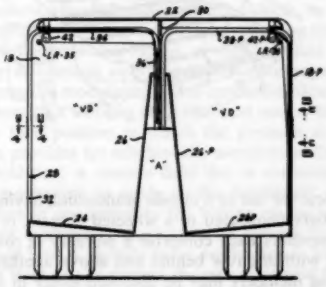
A flexible cover structure is arranged over and around a supporting frame including a plurality of parallel vertical posts at each side of the vehicle and which are normally vertical and hinged in a common plane to swing downwardly into the body of the structure to lower the top and minimize the height of the structure as a whole.

3,752,529

BEVERAGE TRUCK

Theodore Karl Remke, Groose Pointe, Mich., and Russell V. Muller, Park Hills, Ky., assignors to Remke Incorporated, Roseville, Mich.

Filed Feb. 26, 1971, Ser. No. 119,093
Int. Cl. B60p 1/00
U.S. Cl. 296—24 R 13 Claims



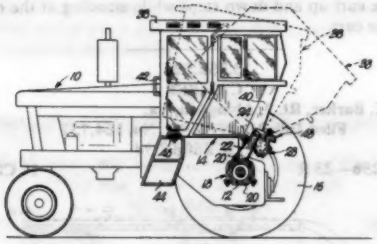
This invention relates to a vehicular beverage truck body similar to those now in use, wherein the flexible doors for each

of the several longitudinal compartments are of greater length than the body height and thus extend into the roof top during its closed usage, however when the doors are opened, they are guided by track members on opposite sides of each of the several independent compartments in such a manner as to be positioned in spaced generally parallel relationship to a vertically disposed central longitudinal wall which extends substantially throughout the full length of said body.

3,752,530
SPRING-LOADED TILTING BRACKETS FOR IMPLEMENT CABS

Charley Voth, Hesston, Kans., assignor to Full Vision, Inc., Newton, Kans.

Filed Oct. 26, 1971, Ser. No. 192,494
Int. Cl. B62d *33/06*
U.S. Cl. 296—35 R **6 Claims**

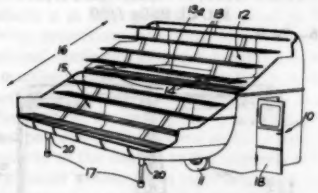


An operator cab swingable between a normal, lowered position and a raised, tilted position has a double-acting compression spring associated with each hinge of the cab which transmits sufficient lifting force to the cab to enable one man to swing the heavy cab between such positions and also functions to cushion the descent of the cab as the center of gravity thereof shifts from one side to the opposite side of its axis.

3,752,531
MOBILE GRANDSTAND

Robert Idris Jones, Kings Leap Castle St., Winchelsea, England

Filed Dec. 30, 1970, Ser. No. 102,867
Int. Cl. B60n *1/00*
U.S. Cl. 296—64 **4 Claims**



A vehicle for use as a mobile grandstand, having two seating members connected to a wheeled chassis, in which the seating members each comprise a plurality of rows of seats arranged with one row behind and above another row, and the seating members may be disposed either in a travelling position, in which they are positioned one above the other, and a seating position in which the seats are so disposed that they form in effect a single tier.

3,752,532
CHAIR CONSISTING OF PARTS ADAPTED FOR QUICK ASSEMBLY AND DISASSEMBLY

Marilyn S. Yarus, 17600 S. Park Blvd., Shaker Heights, Ohio

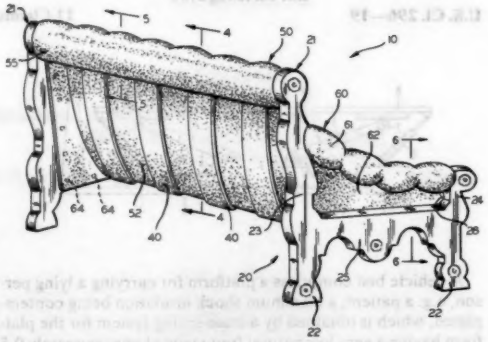
Filed May 20, 1971, Ser. No. 145,230
Int. Cl. A47c *7/00*, *4/00*
U.S. Cl. 297—440 **1 Claim**

A chair consisting of only two relatively thin flat parts, which can be quickly and easily assembled without the use of tools or fastening elements, or drilling of holes in the sides of the parts. Means are provided for assembly of the parts without tilting or rocking of the parts relatively to each and enabling the parts to be automatically and properly positioned in relation to each other. The parts are of uniform thicknesses wherein said parts are superimposed for packing and shipping in a relatively flat container.

3,752,533
UPHOLSTERED SEAT

Evalin S. Gilbert, 2121 N. Bay Shore Dr., Miami, Fla.

Filed Apr. 5, 1972, Ser. No. 241,292
Int. Cl. A47c *1/12*, *5/00*
U.S. Cl. 297—445 **8 Claims**



A frame has a pair of side frame members and a lower front frame member and an elevated rear frame member. Each one of a plurality of straps is secured to the rear frame member and to the front frame member so as to hang somewhat loosely therebetween. A pad, which is carried by the straps, defines a generally-horizontal seating portion adjacent its front and a back rest portion adjacent its rear.

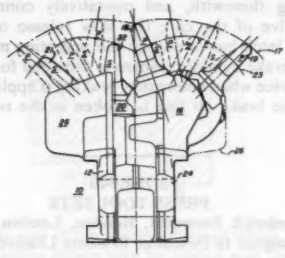
3,752,534
COAL CUTTING USING MORE TEETH FOR SUMPING THAN SHEARING

Lester G. Rollins, 650 Forest Ln., and Glenn S. McDowell, 601 Wiley Ave., both of Franklin, Pa.

Filed June 29, 1971, Ser. No. 158,037
Int. Cl. E21c *25/34*
U.S. Cl. 299—10 **4 Claims**

A method for cutting a deep kerf in a vein of frangible mineral whereby a cutter bar is sumped into a mineral vein at

a rate to cut by all bits in a sequential plurality of bit patterns and then the cutter bar is traversed to shear at a rate such that



only a portion of the bits in a sequential plurality of bit patterns are cutting to extend the kerf.

3,752,535

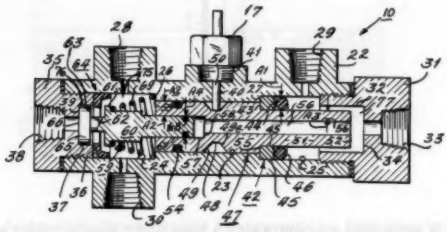
CONTROL VALVE AND SYSTEM

Eugene E. Wallace, Kirkwood, Mo., assignor to Wagner Electric Corporation, Newark, N.J.

Filed Apr. 17, 1972, Ser. No. 244,764

Int. Cl. B60t *8/26*

U.S. Cl. 303—6 C **19 Claims**



A control valve is provided with a proportioning valve movable therein for performing proportioning operations on one of separate fluid pressure supplied thereto, and said proportioning valve is provided with an effective area for subjection to the supplied fluid pressures, said proportioning valve being operable to perform its proportioning operation effecting a reduced application through said control valve of one of the supplied fluid pressures only in the event of the failure of the other of the supplied fluid pressures acting on said area. A warning device may also be provided in the control valve including means for comparing the magnitudes of the supplied fluid pressure and actuated between a normal position and one of opposed translated positions upon the failure of the other supplied fluid pressure. The invention also comtemplates a fluid pressure system having a dual master cylinder therein for generating the supplied fluid pressures and connected through the control valve to a pair of brakes, one of said brakes being energized only in response to the one supplied or applied fluid pressure respectively acting thereon and the other of said brakes being energized in response to both the one and other supplied fluid pressures acting thereon.

3,752,536

ANTI-SKID MECHANISM

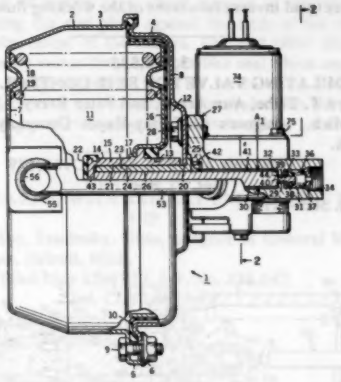
John A. Machek, Creve Coeur, Mo., assignor to Wagner Electric Corporation, Newark, N.J.

Filed Nov. 17, 1971, Ser. No. 199,431

Int. Cl. B60t *8/06*

U.S. Cl. 303—21 F **30 Claims**

An anti-lock device for a vehicle brake system is provided with a control valve actuated in response to signals from a sensing mechanism to subject a control member to vacuum and selectively subject said control member to atmosphere for



controlling the application of supplied fluid pressure to a vehicle brake, and throttling valve means is provided to control the subjection of said control member to the vacuum.

3,752,537

PRESSURE MODULATOR ASSEMBLY

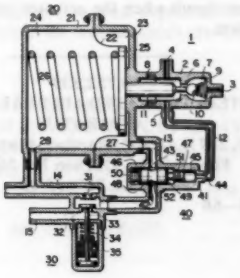
Takeshi Ochiai, Aichi-ken, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha

Filed Nov. 9, 1970, Ser. No. 87,782

Claims priority, application Japan, Nov. 8, 1969, 44/89442; Jan. 29, 1970, 45/8544

Int. Cl. B60t *8/12*

U.S. Cl. 303—21 F **7 Claims**



The assembly modulates the pressure of a working fluid, such as the brake fluid of an automotive vehicle, by the pressure of a control fluid, and includes an operating mechanism having a deflectable diaphragm, a working fluid pressure modulating mechanism operable by the diaphragm and including a pressure modulating piston controlling flow of working fluid through a working fluid line, and means biasing the diaphragm to a position in which the pressure modulating mechanism provides for substantially unrestricted flow to the working fluid line. A control fluid line is connected to the operating mechanism to apply, to the diaphragm, a control fluid pressure in opposition to the biasing means to operate the pressure modulating mechanism to restrict flow to the working fluid line. A throttle valve mechanism is included in the control fluid line to control the rate of control fluid relative to the operating mechanism, and the throttle valve mechanism is subjected to the pressure of the working fluid to vary the rate of flow of the control fluid as a function of the pressure of the working fluid. Application of the control fluid

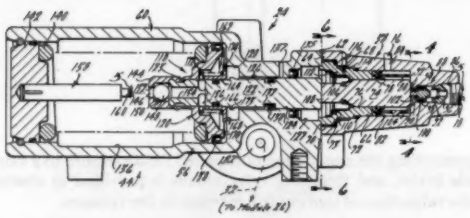
pressure is controlled by a valve operated by an anti-skid mechanism. The rate of flow of the control fluid may be varied as a direct function of the working fluid pressure, as an inverse function of the working fluid pressure, or as a combination of the direct and inverse functions of the working fluid pressure.

3,752,538

MODULATING VALVE FOR SKID CONTROL SYSTEM

Leonard T. Tribe, Ann Arbor, and Peter Every, Livonia, both of Mich., assignors to Kelsey-Hayes Company, Romulus, Mich.

Filed July 22, 1971, Ser. No. 165,179
Int. Cl. B60t *8/04*
U.S. Cl. 303—21 F **13 Claims**



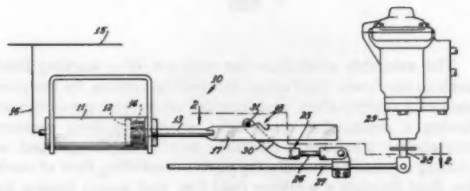
A hydraulically actuated modulating valve actuable to modulate the fluid pressure in a brake system in response to a skid control signal and operable from a source of hydraulic pressure as provided by a power steering pump or the like. A spring holds the modulating valve and a plunger of an expansion chamber in a normal braking position and the hydraulic pressure of the power steering pump is employed to permit movement to a skid control position. The actuator is in a series circuit with the power steering pump and the control valve generates back pressure to move the actuator to its skid control position. A valve carried by the actuator is opened to provide a bypass circuit when the actuator moves to a predetermined position.

3,752,539

REMOTELY OPERATED AIR BRAKE BLEEDING APPARATUS

Clark D. Sill, 217 N. Grand, Marshall, Mich.

Filed July 3, 1972, Ser. No. 268,499
Int. Cl. B60t *15/60*
U.S. Cl. 303—68 **9 Claims**



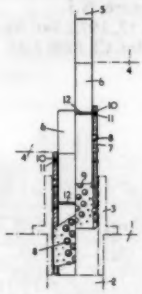
A remotely operated bleeding device for use with air brake systems provided on trains, and particularly for use with freight cars. the device comprises an air cylinder connected to the main brake air pressure pipe. The cylinder has a piston and piston rod, and a helical compression spring arranged to bias the piston toward the end of the cylinder at which air pressure is introduced. The spring and piston arrangement is such that application of air pressure to the air cylinder greater than about 20 psi compresses the spring and forces the piston to remain at the opposite side of the cylinder. The piston remains so during normal operation of the train and braking system. The piston rod is provided with a latch bar either connected thereto or intgral therewith, and a latch bar engaging member cooperating therewith, and operatively connected to the bleeder valve of the car. The slow release of air pressure causes the latch bar to engage the operating member and to bleed the brake cylinder. Means is provided for disabling the bleeder device when emergency braking is applied to the cars, or when the brake air line is broken as the result of an accident.

3,752,540

PRESS-TOOL SETS

Donald Frederick Bosworth, Hendon, London, N.W. 9, England, assignor to Desoutter Brothers Limited, London, England

Filed Mar. 11, 1969, Ser. No. 806,134
Claims priority, application Great Britain, Mar. 27, 1968, 14,819/68
Int. Cl. F16c *1/26*
U.S. Cl. 308—4 C **1 Claim**



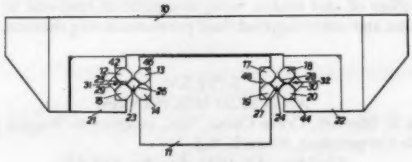
A press-tool set comprising a base and a punch holder with two or more pillars upon one of said members and corresponding bores in the other member and having a linear ball bearing upon each pillar and a circumferential groove in the surface of the cage of the linear ball bearing and either upon the surface of the pillar or upon the bore and a resilient means within one of the grooves, which may be an O-ring which cooperates with the other groove to resist relative longitudinal movement between the cage and the pillar to prevent it moving out of the correct working position as the pillar is withdrawn and reinserted into the bore.

3,752,541

LINEAR BEARINGS

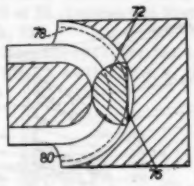
Malcolm John McVey, The Foundry, Queens Rd., High Wycombe, England

Filed Aug. 3, 1971, Ser. No. 168,544
Int. Cl. F16c *29/06*
U.S. Cl. 308—6 C **11 Claims**



A rectilinear rolling bearing in which four rods each formed with at least one longitudinal flat are arranged in a group with

their longitudinal axes parallel and so spaced and orientated that the flats define a guideway for rollers contained therein. There may be a passageway parallel with the bearing and



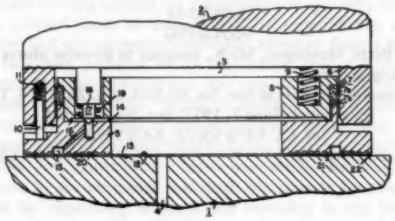
diverters at each end of the bearing through which the rollers circulate. Successive rollers may be placed with their aces at right-angles to each other and alternate rollers may be replaced by balls of the same diameter.

3,752,542

HYDROSTATIC THURST BEARING

Charles E. Kraus, Austin, Tex., assignor to Excelermatic, Inc., Rochester, N.Y.

Filed Apr. 19, 1972, Ser. No. 245,473
Int. Cl. F16c *17/16*
U.S. Cl. 308—9 5 Claims



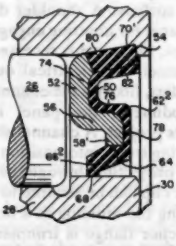
A hydrostatic thrust bearing for supporting a load member on a support member is described wherein one of the members has a cavity into which pressurized fluid is admitted and which has a seal ring disposed therein movably relative to the other member, the adjacent surfaces of the seal ring and the other member forming a limited leakage fluid path. At least one of these surfaces has an annular control recess formed therein to which pressurized fluid is admitted when the load of the load member and, accordingly, the pressure of the fluid in the cavity decreases thereby to lift the seal ring and increase the cross-section of the limited leakage fluid path.

3,752,543

ROLLER HAVING RETAINING END PLATE AND SEAL

Heinrich K. Schmidt, Levittown, Pa., assignor to Roller Bearing Company of America, West Trenton, N.J.

Filed Feb. 16, 1972, Ser. No. 226,725
Int. Cl. F16c *33/78*
U.S. Cl. 308—187.2 4 Claims



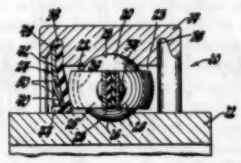
A full complement bearing roller having an improved retaining end plate and seal, suitable for a carriage roller, a mast roller, a cam roller, a track roller and the like. The outer race is combined with a roller and the outer race or the inner race has an annular groove facing toward the space between the outer and inner races. The retaining end plate is provided with a series of spring lugs which engage in the annular groove, locking the end plate against the ends of the rollers and taking the thrust of the rollers. The end plate also has joined to it as by vulcanizing a rubber-like seal which engages the opposite radial member (inner or outer race) from the lugs. In the preferred embodiment the seal also fills the space between the lugs so as to complete the protection.

3,752,544

SEALED BEARING WITH AXIALLY UNDULATING SEAL LIP

Charles N. Hay, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed May 15, 1972, Ser. No. 253,047
Int. Cl. F16c *33/78*
U.S. Cl. 308—187.2 2 Claims



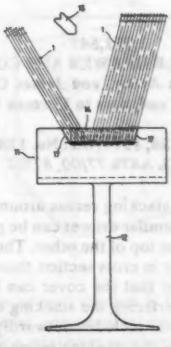
A sealed ball bearing for sealing the annular space between the inner and outer races includes a flexible elastomeric washer that is held in place by a retaining ring mounted in a groove on the outer race. The retaining ring has a plurality of radially inwardly directed spring fingers which urge local segments of the washer axially into contact with the ribbon separator of the bearing thereby causing the washer to assume an axially undulating contact pattern with the inner race. When the bearing is rotated, the separator acts in a camming fashion to axially displace the local segments to establish a traveling wave motion in the washer which prevents contaminant buildup.

3,752,545

ARTICLE STORAGE AND DISPLAY APPARATUS

Eduard Hansjorg Schweizer, Schillstrasse 25, Wesel, Germany

Filed May 22, 1972, Ser. No. 255,264
Claims priority, application Switzerland, June 24, 1971, 9229/71
Int. Cl. A47b *81/06*
U.S. Cl. 312—13 5 Claims



An apparatus for storing containers with tape cartridges or the like comprising at least one substantially quadrangular, for

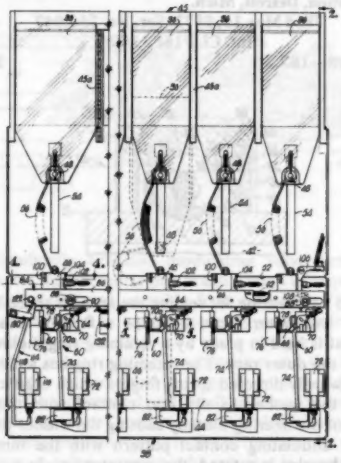
instance rectangular, trough equipped internally thereof with protruding boundary and support means for a number of rows of tape cartridge containers. A cover member is hingedly connected at one edge of the trough. A locking mechanism enables fixing the cover member in its closed position. At least the base surfaces of the trough and cover member are formed of transparent material.

3,752,546

SELECTIVE DISPENSING APPARATUS HAVING DOOR INTERLOCK STRUCTURE

Wilbert O. O'Neal, Independence, Mo., assignor to The Vendo Company, Kansas City, Mo.

Filed Mar. 30, 1972, Ser. No. 239,541
Int. Cl. A47f 1/00
U.S. Cl. 312—35 **11 Claims**



An electromechanical control system for the product selection doors of a multiple-section, product-display vending machine locks the doors closed until a proper coinage deposit has been made, whereupon a selected door may be opened to remove a product from the machine. After opening, the door is automatically held against accidental closing, although manual closing of the open door is permitted after the purchased product is removed. If the open door is not manually closed, a timer associated with the system causes automatic closing of the door after a predetermined period of time has elapsed. The product conveyor of the machine may not be advanced while the door remains open, and any attempt to actuate the conveyor initiates automatic closing of the door.

3,752,547

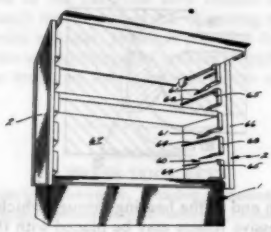
STACKABLE DRAWER AND COVER

Robert L. Propst, Ann Arbor, and James O. Kelley, Spring Lake, both of Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Filed Mar. 26, 1971, Ser. No. 128,250
Int. Cl. A47b 77/00, 87/00
U.S. Cl. 312—107 **8 Claims**

A drawer includes a stacking recess around its top perimeter into which another similar drawer can be placed in order to stack the drawers one on top of the other. The drawer includes a cover which is thinner in cross section than the depth of the stacking recess in order that the cover can be positioned on the drawer without interfering the stacking of one drawer on top of another. The cover includes outwardly biased, resilient ribs which extend below the stacking recess when the cover is in place and which press against the drawer walls to insure a tight fit.

The drawer is supported in a structure having opposite sides with inwardly projecting guide flanges for embracing glide flanges projecting outwardly from the drawer. The stacking



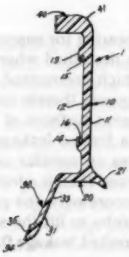
recess is formed in the drawer glide flanges and the cover rests on the glide flanges such that it is also embraced by the guide flanges of the support and cannot be removed from the drawer when the drawer is closed.

3,752,548

MOLDING

Paul J. Betts, Muskegon, Mich., assignor to Browne Morse Co., Muskegon, Mich.

Continuation-in-part of Ser. No. 83,860, Oct. 26, 1970. This application June 7, 1971, Ser. No. 150,581
Int. Cl. A47b 96/18; A47f 9/00
U.S. Cl. 312—140.4 **19 Claims**



This is a molding or splashback for counter tops which is extruded of a suitable plastic and includes a panel, a foot at the base of the panel, and a flexible anchor flange depending downwardly from the rear of the foot for insertion between a closely spaced wall and counter top. A toe projects forwardly and slightly downwardly from the front of the foot for engaging the counter top surface. A shoulder depends rearwardly from the top of the panel for abutting engagement with a wall.

In one embodiment, the panel is recessed to define an outwardly opening channel. An electrical outlet panel, having spaced electrical outlets, fits into the channel.

In another embodiment, the panel includes apertures through which outlets project. A channel-shaped member carrying outlets and wiring snaps into position on the back of the panel with its outlets projecting through the panel apertures.

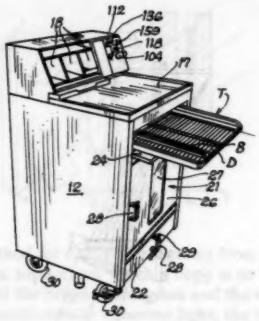
Finally, an adapter clip can be secured to a wall adjacent the floor to facilitate using the molding as a floor-board molding. A portion of the anchor flange is trimmed away and is embraced by an upwardly projecting base flange on the adapter clip.

3,752,549

FOOD HOLDING CABINET

Chester J. Binks, La Grange; Donald F. Helfer, River Grove; Ronald M. Herbert, Hanover Park, and Steve Kroll, Schaumburg, all of Ill., assignors to Restaurant Technology, Inc., Oak Brook, Ill.

Filed Nov. 15, 1971, Ser. No. 198,650
Int. Cl. A47b *77/08, 91/00*
U.S. Cl. 312—236 20 Claims



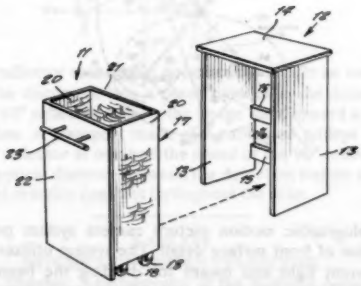
A food holding cabinet for containing and spacedly supporting a vertical stack of trays. Trays are supported in spaced relation and are electromechanically elevated from a bottom tray receiving position to an uppermost tray position. An elevator is actuated to carry a tray upwardly to an uppermost available tray position. When it reaches that position, its direction of movement is automatically reversed, the tray is released, and the elevator returns to the bottom tray receiving position. Automatic close control over the humidity and temperature in the cabinet is achieved. Moisture is automatically added by vaporizing water if the humidity is too low and moisture is dumped by opening the cabinet to the ambient atmosphere if the humidity reaches too high a level. The cabinet is configured to minimize loss of heat and humidity when a cabinet door is opened to introduce or remove a tray.

3,752,550

HAMPER CART

Lois Niemeyer, P.O. Box 76, Humboldt, Ill.

Filed May 19, 1972, Ser. No. 255,171
Int. Cl. A47b *83/00, 95/02, 81/00*
U.S. Cl. 312—237 1 Claim



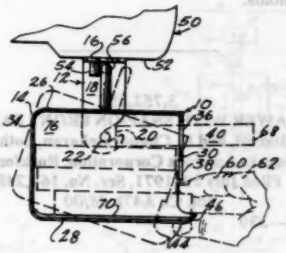
A cart for laundry fits into a housing so to form with it an item of furniture such as a night table or a vanity; the cart consisting of a hamper basket mounted on caster wheels, and the housing including opposite side walls and a top wall so to enclose a space into which the cart is pushed, the front wall of the cart hamper thus forming the front wall of the night table or vanity.

3,752,551

AUTOMOBILE TAPE CARTRIDGE DISPENSING CASE

Jim W. Clark, 2960 Lula Ln., Kennesaw, Ga.

Filed Oct. 27, 1970, Ser. No. 84,279
Int. Cl. A47b *43/00*
U.S. Cl. 312—245 10 Claims



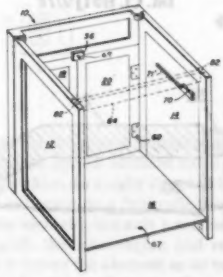
A plastic case arranged to hold a number of magnetic tape cartridges or cassettes for storing same in the automobile when not in use and to allow easy removal by hand when changing from one tape cartridge to another. A box-like case is made from sheet plastic material and is installed underneath the dash panel of an automobile by means of a U-shaped bracket made of plastic with notches on opposite ends into which is fitted a respective projecting plastic pin from opposite ends of the case. The case has a fixed U-shaped plastic handle on the top which serves as a carrying handle when the case is removed from the automobile support bracket and the handle also serves as a stop member to position the case against a projecting pin on the automobile installation bracket so that the front of the case faces properly to the automobile occupants to allow easy selection of the tape cartridge wanted and to permit easy removal thereof as well as insertion of other tape cartridges. The front of the case has tape cartridge slots at the top in a front faced plate and a curved shelf projecting from the bottom beneath bottom dispensing slots from which a tape cartridge is removed. A typical case would hold two stacks of four-tape cartridges each for a total of eight cartridges but cases can be made to hold larger or smaller numbers.

3,752,552

FOLDING CABINET OF MOLDED CONSTRUCTION

Kenneth A. MacDonald, 251 York St., Canton, Mass.

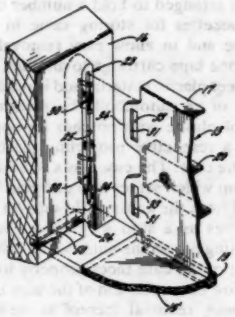
Filed June 28, 1971, Ser. No. 157,231
Int. Cl. B65d *87/00*; B65; ; A47b *43/00*; A43b *47/04*
U.S. Cl. 312—258 12 Claims



A foldable base or wall cabinet is fabricated from articulated molded plastic components assembled for quick and easy erection with a minimum number of parts. A front panel formed with integral hinge portions is provided with a pair of articulated side panels also formed with integral hinge portions which cooperate with the front panel portion and are

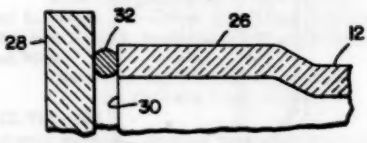
adapted to be folded over against one another when in a collapsed position. A shelf with integral hinge pins pivotally engages the front and side panels by sockets formed between the side panels and the front panel, the shelf being foldable against the front panel when collapsed. Integral locking connections are provided for locking the cabinet in an erected position and various components are interchangeable to reduce the number of molds.

3,752,553
DRAWER WITH SNAP-ON FRONT PANEL
Richard L. Bildahl, and R. Chandrasekaran, both of Rockford, Ill., assignors to Amerock Corporation, Rockford, Ill.
Filed July 29, 1971, Ser. No. 167,248
Int. Cl. A47b *88/00*
U.S. Cl. 312—330 **8 Claims**



Elongated plastic clips are fitted into dovetail slots in the front panel of the drawer and receive the forward ends of the side panels with a snap fit to lock the panels rigidly together. The bottom panel fits into a groove in the front panel and prevents endwise removal of the slips from the slots.

3,752,554
METHOD OF MAKING A LASER TUBE SEAL
John B. Thatcher, 1295 Forgewood Dr., Sunnyvale, Calif.
Filed June 4, 1970, Ser. No. 43,321
Int. Cl. H01j *9/18*
U.S. Cl. 316—19 **5 Claims**

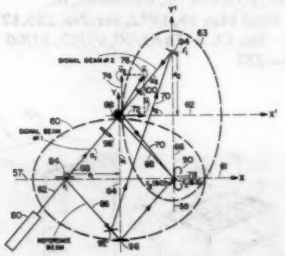


A method for applying members such as windows and resonator mirrors to ends of a laser tube in which the member is first rough aligned and sealed to the tube. After the installation of the laser tube in its permanent supporting structure, the member is fine aligned with respect to the tube and fixed in that position for the subsequent operation and lasing of the laser.

3,752,555
APPARATUS FOR MAKING MULTIPLE POINT HOLOGRAMS
Erhard Paul Artur Klotz, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.
Filed July 23, 1971, Ser. No. 165,570
Claims priority, application Germany, July 24, 1970, P 20 36 904.4
Int. Cl. G02b *27/00*
U.S. Cl. 350—3.5 **2 Claims**

A method and an apparatus for producing point holograms by means of an array of pinhole diaphragms is described. By illuminating the array of pinhole diaphragms through an array of zone plates disadvantages associated with known methods may be avoided.

3,752,556
REAL TIME MOVING SCENE HOLOGRAPHIC CAMERA SYSTEM
Robert L. Kurtz, 10206 Todd Mill Rd., Huntsville, Ala.
Filed June 2, 1971, Ser. No. 149,283
Int. Cl. G02b *27/00*
U.S. Cl. 350—3.5 **3 Claims**



A holographic motion picture camera system producing resolution of front surface detail. The system utilizes a beam of coherent light and means for dividing the beam into a reference beam for direct transmission to a conventional movie camera and two reflection signal beams for transmission to the movie camera by reflection from the front side of a moving scene. The system is arranged so that critical parts of the system are positioned on the foci of a pair of interrelated, mathematically derived ellipses. The camera has the theoretical capability of producing motion-picture holograms of projectiles moving at speeds as high as 9×10^5 cm/sec (about 21,450 mph).

3,752,557

SYSTEM OF HOLOGRAM REPRODUCTION

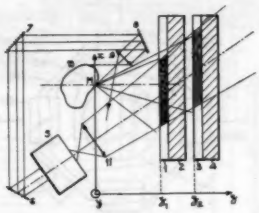
Yves Belvaux, Paris, France, assignor to CSF-Compagnie Generale De Telegraphie Sans Fil, Paris, France

Filed May 31, 1967, Ser. No. 642,490

Claims priority, application France, June 10, 1966, 6665035

Int. Cl. G02b 27/00

U.S. Cl. 350—3.5 6 Claims



An optical method for copying holograms from an original. The photographic support on which a copy is to be made, is positioned behind the original hologram and the whole is exposed to the monochromatic coherent light; the original and the copying supports need not be in contact and the copy is not a reproduction of the original hologram but has the same image forming capabilities as the latter. The exposed copy is processed according to conventional photographic technics.

3,752,558

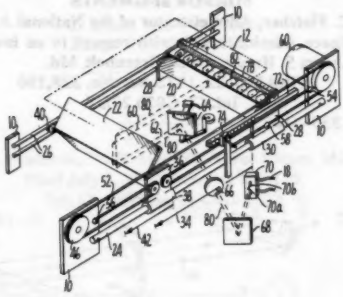
DOCUMENT SCANNER

Lester John Lloyd, Orinda, Calif., assignor to Decision Consultants, Oakland, Calif.

Filed June 28, 1971, Ser. No. 157,348

Int. Cl. G02b 17/00

U.S. Cl. 350—6 7 Claims



A 90° reflector scans a flat document to reflect an image of part of the document into a plane parallel to the document. Then a 180° reflector reflects the image back toward a detection station. A transport made of a cable and pulleys moves the 180° reflector at one-half the speed of the 90° reflector so that the optical distance between the detection station and the document remains constant throughout the scan.

3,752,559

RITCHEY-CHRETIEN TELESCOPE

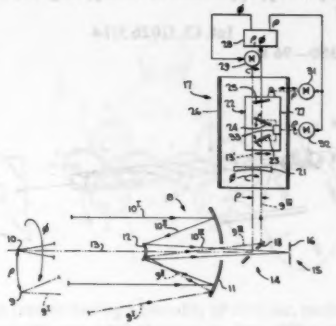
James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Seymour Rosin, Massapequa Park, and Max Amon, Farmingdale, both of N.Y.

Filed Oct. 29, 1971, Ser. No. 193,814

Int. Cl. G02b 17/00

U.S. Cl. 350—55 10 Claims

A Ritchey-Chretien telescope responsive to images located off the telescope optical axis includes transparent flat plate means positioned in the ray path of the image. The flat plate means has a tilt angle relative to the ray path to compensate substantially for astigmatism introduced by the Ritchey-Chretien telescope. The tilt angle of the plate means is directly proportional to the off axis angle of the image. The plate means



preferably comprises two flat plates having opposite inclination angles relative to the ray path. A detector responsive to the optical image as transmitted through the flat plate means is positioned approximately on the sagittal focus of the telescope.

3,752,560

MICROSCOPES INCORPORATING INCIDENT-LIGHT DARK GROUND ILLUMINATION SYSTEMS

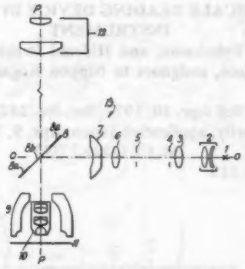
Alick Thompson Lunn, York, England, assignor to Vickers Limited, London, England

Filed Dec. 28, 1971, Ser. No. 213,134

Claims priority, application Great Britain, Jan. 1, 1971, 150/71

Int. Cl. G02b 21/08

U.S. Cl. 350—91 14 Claims



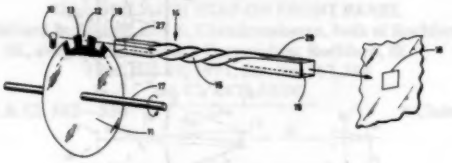
An incident-light dark ground illumination system for a microscope includes an optical element having at one side an inlet region through which an axially directed light beam is admitted so as to be reflected by a first reflecting surface, at an opposite side of the element, towards a second reflecting surface which surrounds the inlet region and reflects the light back again so that it leaves the element as an output beam surrounding the first reflecting surface. A reflector device having a transparent central area, for transmitting light from an objective to an eyepiece of the microscope, and a non-transmitting peripheral reflecting area surrounding the central area, receives the output beam obliquely so as to produce therefrom an annular reflected beam for delivery to an annular input face of an apertured microscope condenser.

3,752,561

TORSIONED LIGHT CONDUCTING MEANS FOR THE ILLUMINATION OF AN IMAGE FIELD WITH MODULATED LIGHT

Arthur Klemt, Olching, Germany, assignor to Arthur Klemt Kommanditgesellschaft

Filed Aug. 12, 1971, Ser. No. 171,173
Claims priority, application Germany, Aug. 19, 1970, P 20 41 211.7
Int. Cl. G02b 5/14
U.S. Cl. 350—96 R 9 Claims



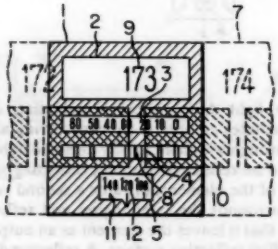
Apparatus for uniformly illuminating an image area with modulated light is disclosed in accordance with the teachings of the present invention. Light of constant intensity is emitted from a light source and periodically interrupted by movable aperture means interposed in the light path extending between the light source and the image area. Elongated light conducting means including a helical portion formed about the longitudinal axis thereof receives the modualted light. The modulated light is subjected to multiple reflections while traversing the helical portion to cause a complete mixing of the received light. The mixed light is transmitted to the image area and admits of an intensity determined by the amount of light transmitted through the movable aperture means. A moving shadow is, therefore, not introduced across the surface of the image area.

3,752,562

OPTICAL SCALE READING DEVICE IN MEASURING INSTRUMENT

Masao Sato, Yokohama, and Hideaki Iwaida, Kawasaki-shi, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Apr. 10, 1972, Ser. No. 242,524
Claims priority, application Japan, Apr. 9, 1971, 46/26156
Int. Cl. G02b 27/32
U.S. Cl. 350—113 1 Claim



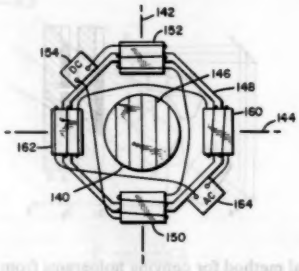
An optical scale reading device employed in distance measuring device or in angle measuring device is disclosed, in which extra portions not to be read are darkened so that necessary reading can be attained quickly and without fail.

3,752,563

MAGNETIC FILM STRIPE DOMAIN DIFFRACTION

Ernest J. Torok; David S. Lo, and David I. Norman, all of St. Paul, Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Continuation of Ser. No. 13,547, Feb. 24, 1970, abandoned.
This application Sept. 1, 1971, Ser. No. 177,081
Int. Cl. G02f 1/22
U.S. Cl. 350—151 17 Claims



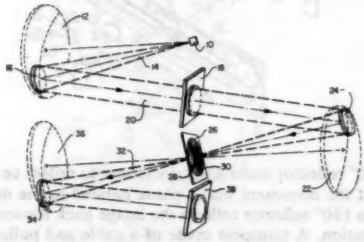
A magneto-optic light deflection system that utilizes the stripe domains in a magnetic film as a diffraction grating. The angle of deflection of the light from the plane of the film is varied in two dimensions by varying the separation and orientation of the stripe domains. The wall separation is varied by varying the intensity of a DC field in the plane of the film parallel to the stripe domains, or by varying the intensity of a DC field normal to the plane of the film. The orientation of the stripe domains is varied by varying the direction of the DC field in the film plane. Hysteresis is overcome by an AC tickle field perpendicular to the stripe domains.

3,752,564

OPTICAL DATA PROCESSING USING PARABOLOIDAL MIRROR SEGMENTS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Akram S. Husain-Abidi, Greenbelt, Md.

Filed Feb. 22, 1972, Ser. No. 228,190
Int. Cl. G02b 27/38
U.S. Cl. 350—162 SF 5 Claims

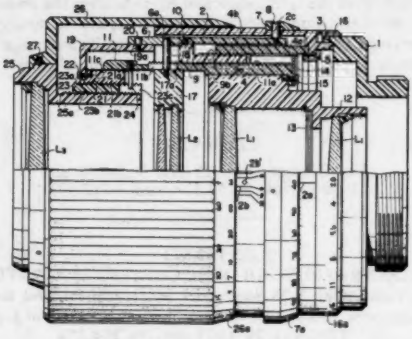


An optical data processing system using paraboloidal reflecting surfaces is disclosed. In the preferred embodiment the paraboloidal reflecting surfaces are segments of a paraboloidal mirror. A source of coherent light is in the focal plane of the first paraboloidal mirror segment which collimates the beam and reflects it toward a second paraboloidal mirror surface. The information to be analyzed, on a transparency for example, is placed in the collimated beam. The beam is reflected from the second paraboloidal mirror segment and focused on a Fourier transform plane. A photon detector could be placed in the Fourier transform plane or suitable spatial filters can be placed thereat, with the filtered beam then being reflected from a third paraboloidal mirror segment to be focused on a reconstruction plane.

3,752,565
ZOOM LENS APPARATUS

Motoi Nagashima, Tokyo, Japan, assignor to Shima Kogaku Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 18, 1972, Ser. No. 227,530
Int. Cl. G02b 7/02
U.S. Cl. 350—255 5 Claims



A zoom lens apparatus comprising an actuating ring adapted to be rotated integrally with a zooming ring, and a first, a second and a third lens group which are caused to move in the direction of the optical axis independently of each other as said actuating ring is rotated, and being operative so that the focal distance may be progressively altered continuously without causing any aberration and/or marginal blurring throughout the range from the extreme wide angle to the telephoto position by the mere rotation of said single actuating ring.

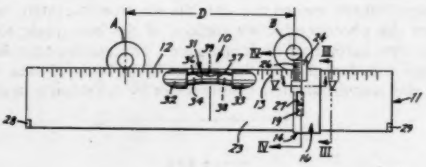
ERRATUM

For Class 350—160 see:
Patent No. 3,753,151

3,752,566
PD RULE

Thomas E. Mathews, 3½ N. Main St., Three Rivers, Mich.

Filed July 9, 1971, Ser. No. 161,138
Int. Cl. A61b 3/10; G01c 9/20
U.S. Cl. 351—5 7 Claims

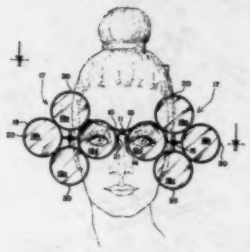


A pupillary distance measuring device having an elongated rule of finite length with at least one straight edge thereon. A pupillary distance measuring scale is provided adjacent the straight edge and extends longitudinally thereof. Gauge means is provided on the elongated rule and extends transversely of the straight edge for measuring an enatomically high eye. Thus, the practitioner can place the straight edge of the elongated rule in close proximity to the eyes of a patient, whose head is in an upright position, and in a horizontally aligned condition so that the gauge means will indicate the magntidue of an anatomically high eye.

3,752,567
EYEGLASSES HAVING INTERCHANGEABLE COLORED LENSES

Kent Broadhurst, 24 Cornelia St., New York, N.Y.

Filed July 1, 1971, Ser. No. 158,817
Int. Cl. G02c 9/04, 7/08, 5/08
U.S. Cl. 351—47 1 Claim

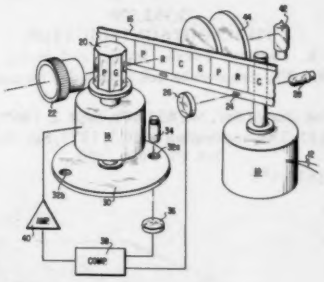


Eyeglass frames having a plurality of circular, multi-colored lenses pivotably mounted thereon so that different colored lenses may be rotatably interchanged in front of the eyes of the wearer of the glasses. The lenses are mounted in a frame which has a small, rounded projection protruding from the edge thereof, adjacent each lens which snaps into a pair of projections provided on the nose bridge of the eyeglass frames in order to lock the lenses into position. The eyeglass frames are pivotably connected above the nose bridge of the eyeglasses in order to allow easy folding of the eyeglasses into a planar configuration.

3,752,568
COLOR MOTION-PICTURE PROJECTION SYSTEM

Pierre Perreau, Paris, France, assignor to Schlumberger Instruments Et Systemes, Paris, France

Filed Oct. 28, 1971, Ser. No. 193,407
Claims priority, application France, Oct. 28, 1970, 38827
Int. Cl. G03b 33/00
U.S. Cl. 352—66 1 Claim

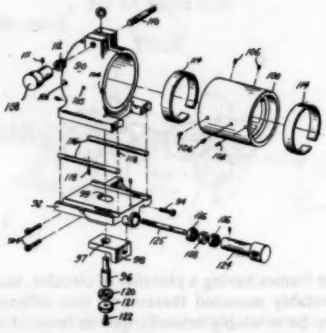


Color motion-picture projection system of the additive synthesis type.

For each multicolor image of the original film, the black and white film used has a given number of selected single-color images following one another in a uniform order of color. A synchronizing mark is placed at each image of a given color. The projector has a single lens, a capstan to drive the black and white film continuously, a multiple face prism provided with colored coatings driven by a motor. The rotation of the capstan is servo-controlled to that of the prism. The projection is stable and the images are projected by means of a suitable colored light.

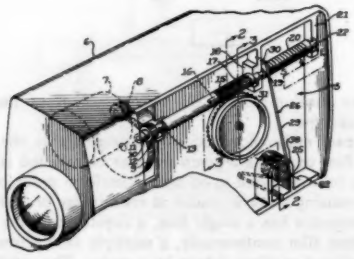
Compared with a direct multicolor film projection system, cost is considerably reduced and projection is of comparable quality.

3,752,569
PROJECTOR MECHANISM
Edward J. Nelson, and Ilo M. Brown, both of Omaha, Nebr., assignors to Ballantyne of Omaha, Inc., Omaha, Nebr.
Filed Oct. 29, 1971, Ser. No. 193,917
Int. Cl. G03b *3/00*
U.S. Cl. 352—139 **4 Claims**



Motion picture projector mechanism having means a support for the film for movement through the projector mechanism in both a forward and a reverse direction, the support including spaced-apart guides for retaining the film curved in cross-section (convex relative to the light source) over a substantial length to rigidify the film for both forward and reverse movement. The support includes a film gate and film trap that can be removed as an assembly, eliminating the necessity of adjustment to keep the film gate in perfect alignment to the film trap. The film gate can readily be removed from the assembly for cleaning, with provision being made to adjust the film shoe tension while the projector mechanism is operative. The lens holder mechanism is designed to accept different diameter lenses so as to provide for cinemascopic and wide screen viewing and provides prefocusing of such lenses. It is mounted on a double V-slide and has a microlens focus adjustment.

3,752,570
FILM FOOTAGE INDICATOR
Richard K. Carlson, Tokyo, Japan, and Henry J. Koeber, Deerfield, Ill., assignors to Bell & Howell Company, Chicago, Ill.
Continuation of Ser. No. 854,479, Sept. 2, 1969, Pat. No. 3,650,611. This application Sept. 3, 1971, Ser. No. 177,731
Int. Cl. G03b *1/60*
U.S. Cl. 352—172 **3 Claims**

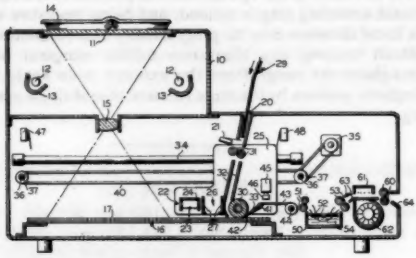


A film footage indicator for movie cameras including a power source operable to drive a driving worm gear when the film is being advanced, a driven worm gear having a single row of teeth helically offset on the periphery thereof which are engageable with and driven by the driving worm gear, a pinion gear rigidly mounted on a shaft which is coaxial with but rotatable relative to the driving worm gear and in mesh with and rotated by the driven worm gear teeth, an indicator worm gear rotatable by the pinion gear, a spring indicator flexibly operably to engage the indicator worm gear by inserting a film cartridge into the camera and flexibly operable to be advanced by the rotating indicator worm gear and a marked window in the camera housing located in alignment with the advancement of the spring indicator for indicating the amount of exposed film. Upon removal of the cartridge from the camera, the spring element indicator will automatically disengage from the indicator worm gear and return to the initial (start) position.

ERRATA

For Classes 353—19 and 353—38 see:
Patent Nos. 3,752,574 and 3,752,575

3,752,571
ELECTROPHOTOGRAPHIC COPYING APPARATUS
Isao Yamaguchi, 1-28 Saigo-dori, Moriguchi-shi, and Hitoshi Katayama, D-308, 801 Hoshida, Katano-shi, both of Japan
Filed Aug. 28, 1972, Ser. No. 284,276
Claims priority, application Japan, Sept. 1, 1971, 46/67699
Int. Cl. G03g *15/00*, *15/18*
U.S. Cl. 355—3 **9 Claims**

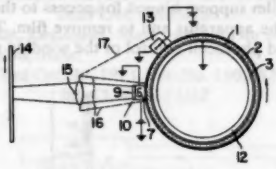


A copying apparatus for producing a visible image of an original on a copy sheet which has a conductive base and a dielectric surface. During the movement of a carriage across a photoconductive base plate, charging means imposes a uniform electrostatic charge on the photoconductive surface of the base plate, projecting means successively projects a partial light image onto the uniformly charged photoconductive surface of said base plate through framing means to form an electrostatic latent image of an original on the base plate, and charge transfer means transfers the electrostatic latent image from the photoconductive surface of the base plate to the dielectric surface of the copy sheet. The electrostatic latent image transferred onto the dielectric surfaces of said copy sheet is converted into a visible image by developing means.

3,752,572
APPARATUS FOR MAKING ELECTROGRAPHS
Yoshiyuki Watanabe, Tokyo, and Koichi Kinoshita, Narashino, both of Japan, assignors to Katsuragawa Denki Kabushika Kaisha, Tokyo-to, Japan
Division of Ser. No. 481,365, Aug. 20, 1965, Pat. No. 3,536,483. This application Apr. 2, 1970, Ser. No. 25,009
Claims priority, application Japan, Oct. 20, 1964, 39/59570
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 **10 Claims**

An electrographic apparatus in which a relative movement is established between a photosensitive element exhibiting persistent internal polarization and a corona discharge device while an optical system creates a light image through the

corona discharge device, opposite polarity field charges are created in the photosensitive element in succession, and the light image is formed in the element during the second field



charge whereby a latent image is created electrostatically in the photosensitive element corresponding to the projected light image.

3,752,573

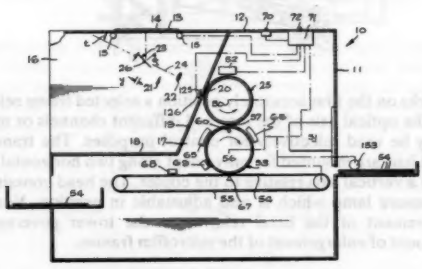
ELECTROSTATIC COPYING MACHINE

Wendell S. Miller, 1341 Comstock Ave., Los Angeles, Calif.

Filed Apr. 29, 1971, Ser. No. 138,449

Int. Cl. G03g *15/22*

U.S. Cl. 355—11 **16 Claims**



A copying machine for making large numbers of xerographic copies by first forming an electrostatic image of the subject matter to be copied on a first carrier unit, and then making a series of electrostatic images from that first image on a second unit, and printing a series of copies of the subject matter on successive copy sheets by the second unit. Retention of the initial image on the first electrostatically chargeable unit enables removal of the original sheet to be copied from the machine while the reproductions thereof are still being produced. A mechanism is also provided to maintain constant the optical path length of a tilting mirror photoreproduction device with flat platten during the tilting of the mirror.

3,752,574

AUDIO-VISUAL APPARATUS

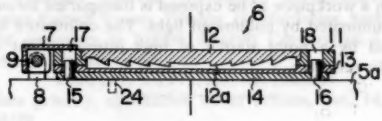
Saburo Kato, Tokyo, and Saburo Hokari, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Aug. 25, 1971, Ser. No. 174,701

Claims priority, application Japan, Sept. 8, 1970, 45/89253; Sept. 8, 1970, 45/89254; Oct. 30, 1970, 45/108091

Int. Cl. G03b *31/06, 1/48, 21/14*

U.S. Cl. 353—19 **6 Claims**



An audio-visual apparatus simultaneously reproduces a sound magnetically recorded on a teaching material or audio-visual sheet and projects onto a screen a writing or picture printed or otherwise superposed on the sheet. The apparatus includes a magnetic sound reproducer having a record mounting surface adapted to support a audio-visual sheet with its magnetic record surface facing downwardly. A head, including a light source, a projecting lens and a reflector is positioned above the sound reproducing means, and directs light rays, reflected from the upper surface of the audio-visual sheet through the projection lens, to a screen. A Fresnel lens is pivotally mounted for pivoting toward the mounting surface to press against the audio-visual sheet carrying audio and visual recorded information, to maintain the sheet in a predetermined position on the sound reproducer. The audio-visual sheet includes a base formed with holes for correctly positioning the sheet on the support surface, a reflector surface provided on one surface of the base and a magnetic recording surface provided on the other surface of the base. A transparent layer is formed on the reflector surface and may carry the graphic material to be projected.

3,752,575

OVERHEAD PROJECTOR

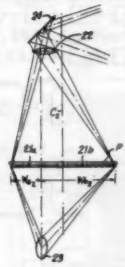
Hisanori Ataka, Kawasaki-shi, Japan, assignor to Ricoh Co. Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 47,102, June 17, 1970, abandoned. This application Oct. 16, 1972, Ser. No. 297,747

Claims priority, application Japan, June 17, 1969, 44/57230

Int. Cl. G03b *21/14, 21/28*

U.S. Cl. 353—38 **3 Claims**



An improved overhead projector capable of employing a smaller sized reflecting mirror, thereby making the projector compact in size, wherein a Fresnel condenser lens system, which serves as the stage or is disposed adjacent to a stage, comprises at least two Fresnel lenses having different widths and/or different focal lengths so that the light beams refracted by the different Fresnel lenses may be made incident at different angles upon the projection lens and thus upon the surface of the reflecting mirror, particularly the upper half portion, thereby permitting the reflecting mirror to be shortened. Individual light sources may be used for respective Fresnel lenses so that they may be moved closer together further decreasing the size of the projector.

3,752,576

TRANSPORT FOR PARTICULATE MATERIAL

Dennis P. Gerbasi, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

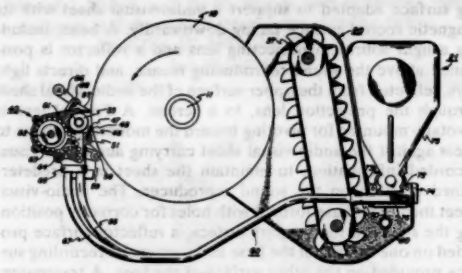
Continuation-in-part of Ser. No. 838,816, July 3, 1969. This application May 27, 1971, Ser. No. 147,567

Int. Cl. G03g *15/00*

U.S. Cl. 355—15 **9 Claims**

Apparatus for use in an automatic xerographic reproducing apparatus for cleaning residual toner material from the

photoconductive surface after the image has been transferred to a final support material and for returning the residual toner



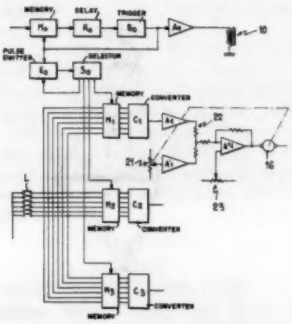
to a xerographic developing station for reuse in the xerographic process.

3,752,577

LIGHT-CORRECTION SYSTEM FOR PRINTERS OF COLOUR CINEMATOGRAPHIC FILMS

Roger Grossetete, Yerres, and Jean Pierre Blaublomme, Paris, both of France, assignors to Etablissements Andre Debrie, Paris, France

Filed Nov. 15, 1971, Ser. No. 198,590
Claims priority, application France, Dec. 16, 1970, 7045353
Int. Cl. G03b *27/76*
U.S. Cl. 355—36 **4 Claims**



A light-correction system for cinematographic colour film printers which operate on the additive three-colour principle. Electric pulses, originating in binary form from a reader of a perforated programming tape on which information relating to desired corrections is stored, are converted for each of the three primary colours by a digital-analogue arrangement into a representative electric voltage, and the opening of each of three corresponding flux modulators is controlled by a respective electric motor which is supplied with the respective voltage through a position-control potentiometric assembly. Each of the flux modulators includes a cam for converting rotation of the corresponding motor into angular displacement of a pivoting member mounted for rotation on an operating shaft of an aperture shutter of the respective modulator.

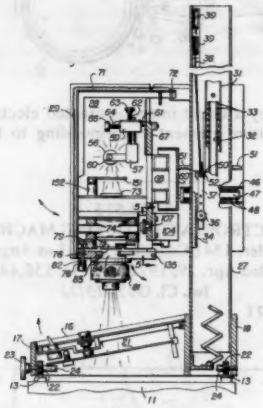
3,752,578

MICROFILM TRANSPORT AND ENLARGER FOR MAKING PRINTS AND PLATES

Donald R. Allan, 650 Second St., Menlo Park, Calif.

Filed Apr. 27, 1972, Ser. No. 248,029
Int. Cl. G03b *27/56*
U.S. Cl. 355—63 **11 Claims**

Microfilm is a source for exposure of sensitized paper or plate stock in an electrostatic copier, or other equipment, wherein light exposes light-sensitive material. The device has a base which may be mounted on the copier and a tower above the base carrying a housing. The film transport is motor driven from a supply reel to a take-up reel supported by the housing which has a film support hinged for access to the film for adjustment of the apparatus and to remove film. The transport has a light and photocell control of the winding motor so that



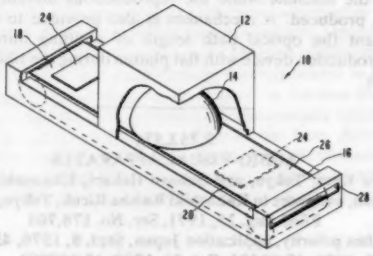
marks on the film accurately position a selected frame relative to the optical axis of the lens and different channels or marks may be used selectively for control purposes. The transport and lens are mounted for movement along two horizontal axes and a vertical axis relative to the copier. The head contains an exposure lamp which is also adjustable in position. Vertical movement of the head relative to the tower governs the amount of enlargement of the microfilm frames.

3,752,579

LIGHT EXPOSURE APPARATUS AND METHOD

Charles Herman Keller, and Patrick Oliver Wilson, both of Sunnyvale, Calif., assignors to Pek, Inc., Sunnyvale, Calif.

Filed June 14, 1971, Ser. No. 152,510
Int. Cl. G03b *27/04*
U.S. Cl. 355—97 **14 Claims**



A light exposure apparatus and method is provided herein wherein a workpiece to be exposed is transported through an area illuminated by collimated light. The collimated light is provided by a point source of high intensity light and a parabolic reflector.

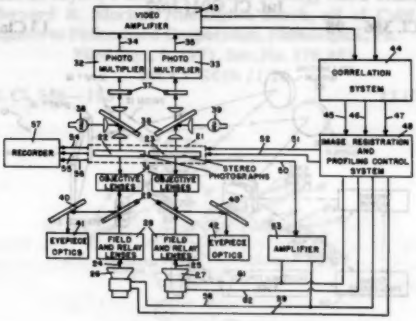
ERRATUM

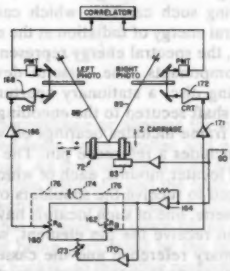
For Class 355—10 see:
Patent No. 3,753,174

3,752,580
STEREO INSTRUMENT HAVING DIFFERENTIALLY VARIED LEFT AND RIGHT PARALLAX ERROR SIGNALS FOR PRODUCING SCANNING PATTERN DISPLACEMENTS

John W. Hardy, Lexington, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Oct. 20, 1971, Ser. No. 190,862
Int. Cl. G01c *11/12*
U.S. Cl. 356—2 **7 Claims**





An automatic stereoplotting system employing both a high speed primary servo-system for inducing substantially instantaneous primary relative displacements between scanning patterns to eliminate detected parallax, and a more massive and slower reacting auxiliary servo system for inducing relative displacements between left and right stereo photographs being scanned. The auxiliary displacements of the photographs replace the initial primary displacements of the scanning patterns and a readout mechanism records measured elevations by continuously indicating the algebraic summations of both the primary and auxiliary displacements. A distribution circuit is provided for distributing the displacements of the scanning patterns between the scanning systems for the left and right stereo photographs so as to eliminate the parallax from each photograph in proportion to the actual image displacement on each photograph.

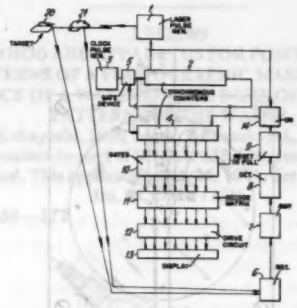
This invention is an improvement on the Automatic Stereoplotting Apparatus described in U.S. Pat. No. 3,677,645, filed Mar. 1, 1970.

3,752,581
RANGEFINDER

Frank Geoffrey Everest, Stevenage, Hertfordshire, and Thomas Patrick Veasey, Hitchin, Hertfordshire, both of England, assignors to British Aircraft Corporation Limited, London, England

Filed Oct. 5, 1971, Ser. No. 186,629
Claims priority, application Great Britain, Oct. 14, 1970, 48,764/70
Int. Cl. G01c *3/08*
U.S. Cl. 356—5 **8 Claims**

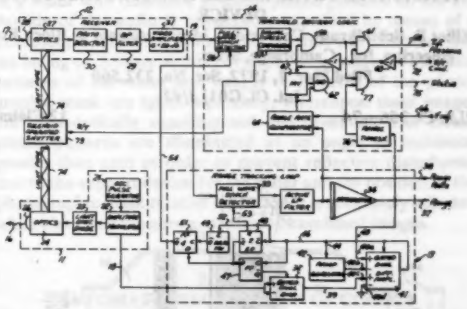
A rangefinder which includes a transmitter for transmitting a pulse of electromagnetic energy towards a target, and a receiver for receiving reflections of that pulse, in which means is provided for ensuring that although reflections may be received from light reflecting media located between the transmitter and the target, only the last received reflection, which is from the target, is used to provide the indication of the range of the target.



3,752,582
OPTICAL RANGE AND RANGE-RATE SENSOR

William C. Troll, Rochester, and Richard L. Fowler, Royal Oak, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Jan. 27, 1971, Ser. No. 110,222
Int. Cl. G01c *3/08*
U.S. Cl. 356—5 **15 Claims**

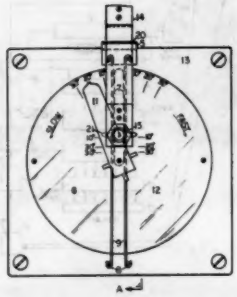


An optical system for measuring the range and range-rate between two objects is described. An optical sensor system transmits modulated optical energy and receives energy reflected from an object. The optical sensor system includes a narrow band correlation type receiver and a transmitter which uses a single tone frequency to amplitude modulate a noncoherent continuous wave output. Range is measured as a function of the modulation envelope phase delay of the received signal with respect to the reference transmitted signal by a range tracking loop. A synchronous detector generates a range tracking error signal which is filtered and used to control a time delay of the reference signal input to the synchronous detector. The tracking loop causes the delay introduced into the reference signal to approximate the received signal modulation envelope delay, so a signal proportional to the reference signal delay is used as the range output signal. Range rate is derived by differentiating the range signal.

3,752,583
MODIFIED SYNCHROSCOPE

Joseph Moschetta, 535 Dixie Dr., Penn Hills, Pa.

Filed Sept. 9, 1971, Ser. No. 178,863
Int. Cl. G01r 25/00
U.S. Cl. 356—23 4 Claims

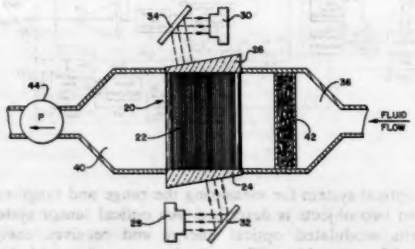


An electrical synchroscope, modified to accomodate a light source and a light sensitive device, both mounted on a vertically adjustable mechanism and facing each other through a slot in the dial of the synchroscope so that as the instrument pointer rotates it can block the light rays from the light sensitive device at different indicated points on the dial, this in turn initiating an externally operated electrical circuit.

3,752,584
ATTENUATED TOTAL REFLECTION SPECTROSCOPIC DEVICE

Elliot R. Schildkraut, Cambridge, Mass., assignor to Block Engineering, Inc., Cambridge, Mass.

Filed Mar. 7, 1972, Ser. No. 232,560
Int. Cl. G01j 3/42
U.S. Cl. 356—74 12 Claims

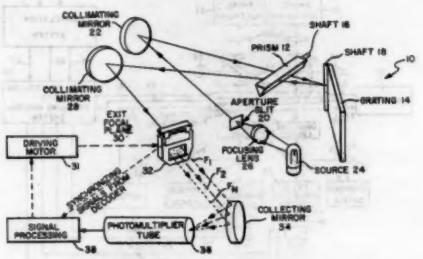


A spectroscopic device and method of using attenuated total reflection techniques for analysis of samples of particulate solids in a fluid. A beam of radiation is passed through an optical cell comprising a plurality of elongated, totally internally reflecting elements, e.g., fiber optics, arranged as a mechanical filter. When fluid containing the particles is passed transversely across the cell, the latter are trapped in the filter whereupon radiation passing through the elements is selectively absorbed, thus providing an optical output having an absorption spectrum which may be utilized to identify the sample.

3,752,585
SPECTROMETER SYSTEM CONTAINING AN INTERCHANGEABLE ENCODING CASSETTE

William G. Elliott, Lincoln, Mass., assignor to SpectraMetrics, Incorporated, Burlington, Mass.

Continuation-in-part of Ser. Nos. 106,500, Jan. 14, 1971, Pat. No. 3,658,424, and Ser. No. 106,561, Jan. 14, 1971, Pat. No. 3,658,423, each is a continuation of Ser. No. 710,881, March 6, 1968, abandoned. This application Apr. 17, 1972, Ser. No. 244,665
Int. Cl. G01j 3/02
U.S. Cl. 356—98 13 Claims

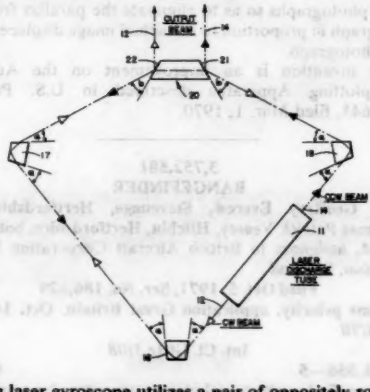


An interchangeable encoding cassette and a spectrometer system employing such cassette, which cassette device encodes the spectral energy of radiation at the exit focal plane of a spectrometer, the spectral energy represented by horizontal and vertical components. The cassette device comprises a rotating encoding disc, a stationary aperture plate, a frame element, and a shaft secured to the encoding disc for rotation therewith. The frame includes bearings on which the shaft is mounted and includes a reference pin. The spectrometer includes a pair of locater mounts, each of which has a precision V groove adapted to receive the shoulders of the bearing element of the cassette, one of such locators having an adjustable track adapted to receive the pin element, whereby the shaft serves as a primary reference and the cassette device is adjusted into the desired precision position by the position of the reference pin in the restraining track.

3,752,586
MINIMIZING FREQUENCY LOCKING IN RING LASER GYROSCOPES

Thomas J. Hutchings, Orange, and Joseph Winocur, Newport Beach, both of Calif., assignors to North American Rockwell Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 637,832, May 11, 1967, abandoned. This application Aug. 4, 1969, Ser. No. 849,262
Int. Cl. H01s 3/05, 3/10
U.S. Cl. 356—106 LR 10 Claims



A ring laser gyroscope utilizes a pair of oppositely rotating beams which are given a difference frequency in accordance

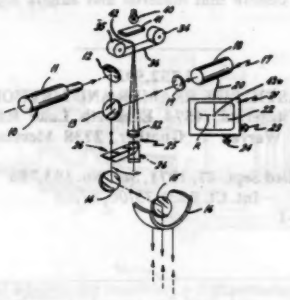
with the rotation rate of their optical paths. A plurality of frequency modulated bias signals are imposed upon the beams, the modulation indices of these frequency modulation signals being chosen to minimize the effects of frequency locking at low rotation rates.

3,752,587

APPARATUS FOR BORESIGHTING A LASER BEAM EMITTER DEVICE

James G. Myers, Fullerton; Francis J. Berg, Costa Mesa, and Bernard R. Martus, Huntington Beach, all of Calif., assignors to Philco-Ford Corporation, Philadelphia, Pa.

Filed Sept. 9, 1971, Ser. No. 178,857
Int. Cl. G01b 11/26
U.S. Cl. 356—153 12 Claims



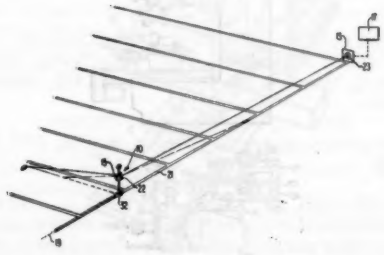
A system for boresighting or aligning the optical axes of a combined infrared laser beam emitter and a low light level television telescope. An optical switch is located in the system where the axes of the telescope and the laser beam are combined, and is effective to divert at least a portion of the laser beam to a lens that focuses the beam on an opaque surface that is capable of being perforated by the laser energy. The opaque surface is backlit, so that after perforation by the laser a bright point of light can be seen in the telescope. If the axes of the laser beam and telescope are aligned, the bright spot will appear at the reticle center of the telescope. If not aligned, the axes are adjusted to produce alignment, or boresighting. The opaque surface is formed on a strip, and an automatic advancing device is operable to advance the strip to present a fresh opaque test surface, upon each boresighting operation.

3,752,588

LASER FOOTBALL FIRST DOWN MEASURING DEVICE

James D. Chapman, 2430 Butt Ave., Lima, Ohio

Filed July 14, 1971, Ser. No. 162,471
Int. Cl. G01b 11/26
U.S. Cl. 356—152 8 Claims



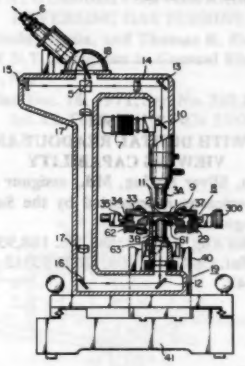
An optical laser measuring device more particularly for measuring the required distance necessary for a first down in the sport of football. The forward pole marker includes a laser unit pivotably mounted to the marker for sweeping the football field with a visible signal. Means for perpendicularly aligning the laser unit is provided on the pole marker and insulation for protecting the laser unit from shock can be optionally added.

3,752,589

METHOD AND APPARATUS FOR POSITIONING PATTERNS OF A PHOTOGRAPHIC MASK ON THE SURFACE OF A WAFER ON THE BASIS OF BACKSIDE PATTERNS OF THE WAFER

Masaaki Kobayashi, 2808 Sagoa, Kawasaki-shi, Japan

Continuation-in-part of Ser. No. 835,336, June 23, 1969, abandoned. This application Oct. 26, 1971, Ser. No. 192,395
Int. Cl. G01b 11/26
U.S. Cl. 356—172 12 Claims



In the fabrication of a semiconductor device, an operation for positioning patterns of a photographic mask on the surface of a wafer with reference to metal-placed patterns on the underside of the wafer is remarkably improved by means of a microscopical method utilizing at least one pair of object lenses facing each other so that corresponding images of the basic patterns of the wafer and images of patterns of the photographic mask are taken separately, whereupon these images are then optically superimposed and observed. The metal-plated patterns are illuminated at an angle of incidence greater than zero in order to prevent reflective disturbance due to the support device for the wafer and the position of the photographic mask relative to the wafer is accurately adjusted while observing the above-mentioned combined images.

3,752,590

AUTOMATIC RECOGNITION OF COLORS

Pierre Frappe, Lyon, France, assignor to Verdal S.A., Lyon, France

Filed Nov. 9, 1971, Ser. No. 196,889
Claims priority, application France, Nov. 30, 1970, 7043976
Int. Cl. G01j 3/46, 3/42
U.S. Cl. 356—176 8 Claims

The invention refers to a method for the automatic recognition of coloring dyes, for instance in a drawing, by illuminating

the sample by a beam of light of known characteristics and by analyzing the light reflected in a number of primary colors or wave lengths, recognition of the dye from which the light is reflected being based on the position of the point which represents the responses of the photo-sensitive analyzing means corresponding to each primary color in a system of coordinates having a number of axes equal to the number of said primary colors. According to the invention the real locus (surface or volume) of all possible representative points is determined for each dye, lines or surfaces are drawn to pass between these loci, these lines or surfaces are each represented analogically by electronic circuits receiving as inlet signals the responses of the photo-sensitive means to emit a zero outlet signal for a point which would be situated on this line or surface and the position of the representative point of an unknown dye is deduced from the signs of the outlet of these circuits.

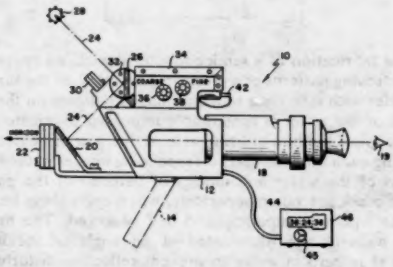
Alternatively the dyes are considered by pairs in a number of two-dimensional coordinate systems.

3,752,591

SEXTANT WITH DIGITAL READOUT AND NIGHT VIEWING CAPABILITY

Sidney Feldman, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 4, 1971, Ser. No. 168,931
Int. Cl. G01c *1/08*; G02b *23/12*
U.S. Cl. 356—247 **3 Claims**



A navigation instrument for measuring the altitude of celestial bodies above the horizon adaptable to use with ordinary iron sights, a standard telescope for daylight viewing, and an electronic image enhancing telescope for night viewing of the horizon. Digital readout of the altitude of the celestial bodies is available on the instrument as well as electrically telemetering this information to a remote site where it may be recorded along with the time of observation.

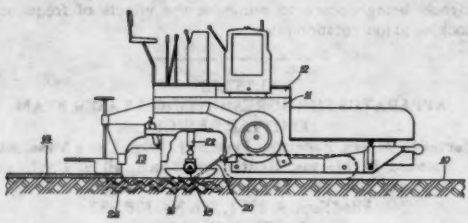
3,752,592

METHOD AND APPARATUS FOR COMPACTING THE PLACEMENT MATERIAL IN ROAD BUILDING

Alois Paar, Dusseldorf, and Fritz Konig, Wuppertal-Vohwinkel, both of Germany, assignors to Losenhausen Maschinenbau AG, Dusseldorf-Grafenberg, Germany

Filed Apr. 29, 1971, Ser. No. 105,821
Claims priority, application Germany, May 2, 1970, P 20 21 457.7
Int. Cl. E01c *7/26*
U.S. Cl. 404—102 **6 Claims**

A machine applies a layer of paving material to a subgrade to form a road. Immediately in front of the transverse line along which the material is deposited, the subgrade is vibrated in a manner such that the vibrations extend rearwardly and



under the paving material being deposited on the subgrade to compact and cohere that material and adhere it to the subgrade.

3,752,593

PLASTIC PIPE REAMER AND METHOD

Harold W. Fitzgerald, 4574 Elizabeth Lake Rd., Pontiac, Mich., and Warren T. Gunther, 2738 Merelus, Pontiac, Mich.

Filed Sept. 27, 1971, Ser. No. 183,756
Int. Cl. B23b *35/00*, *41/06*
U.S. Cl. 408—1 **5 Claims**

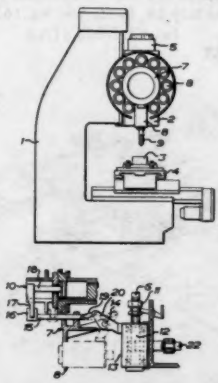
A pipe reamer apparatus particularly for use with plastic pipe and a method of reaming plastic pipe fittings such as elbows or the like.

3,752,594

TURRET TYPE UNIVERSAL MILLING, DRILLING AND BORING MACHINE

Sven-Erik Svanstrom, Vasteras, Sweden, assignor to SMT Machine Company AB, Vasteras, Sweden

Filed Nov. 19, 1971, Ser. No. 200,333
Claims priority, application Sweden, Dec. 7, 1970, 16491/70
Int. Cl. B23b *39/20*; B23q *3/157*
U.S. Cl. 408—35 **5 Claims**



A universal milling, drilling and boring machine for a plurality of rotary tools includes a headstock having a drive. The

headstock comprises a drum rotatably mounted thereto and equipped with a number of spindle units for the rotary tools which units are rotatably mounted on the drum and which in normal position are oriented at least substantially parallel with the axis of rotation of the drum. The headstock has an operating unit which is adapted to swing the spindle unit opposite the drive into operative position in the headstock, in which position the drive is connectable to the spindle unit.

3,752,595

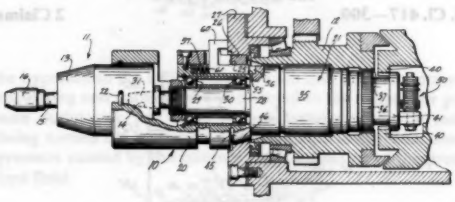
ADAPTER FOR DRILL SPEEDER

Robert T. Woythal, West Allis, and James L. Kirschnik, Brookfield, both of Wis., assignors to Kearney & Trecker Corporation, West Allis, Wis.

Filed Mar. 31, 1971, Ser. No. 129,854

Int. Cl. B23b *47/14*

U.S. Cl. 408—124 **12 Claims**



A special adapter for receiving a drill speeder to enable the drill speeder to be handled by an automatic tool changer for insertion into and removal from a rotary spindle of a machine tool. The adapter provides for coupling the spindle of the machine tool to drive the drill speeder while retaining the outer housing of the drill speeder stationary without intervention by the machine tool operator.

3,752,596

HYDROSTATIC SUPPORT FOR LONGITUDINALLY DRIVEN MACHINE POST

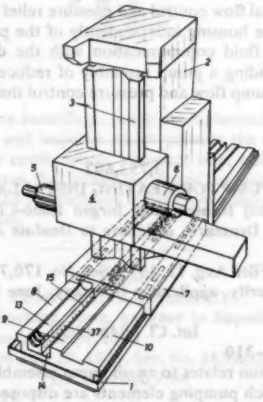
Manfred Weyand, Meerbusch, and Manfred Picker, Buttgen, both of Germany, assignors to Schiess Aktiengesellschaft, Dusseldorf-Oberkassel, Germany

Filed Apr. 10, 1972, Ser. No. 242,452

Claims priority, application Germany, Apr. 10, 1971, P 21 17 701.5

Int. Cl. B23c *9/00*; B23b *47/00*

U.S. Cl. 408—234 **1 Claim**



A machine tool with an upright post which is displacable on a stationary machine tool bed in the longitudinal direction thereof by a worm rotatably journalled in said post and meshing with a worm gear rack connected to the machine tool bed. The foot portion of the post has supporting surfaces by means of which it is horizontally slidably and vertically movably supported on the bed, which supporting surfaces are provided with groups of pressure fluid receiving pockets, the pockets of each group being arranged one behind the other in the longitudinal direction of the bed while being open toward the bed. The foot portion of the post is also provided with two oppositely located lateral guiding surfaces one of which engages one lateral surface of the worm gear rack for laterally guiding the post. This one lateral guiding surface has one pressure fluid receiving pocket which through passages in the worm gear rack communicates with the flanks of the respective teeth of the worm gear rack which are being engaged by the worm.

3,752,597

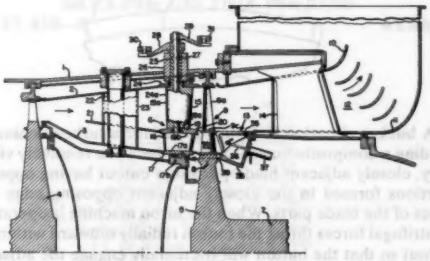
FLOW PATH DEFLECTOR FOR AXIAL FLOW REVERSING GAS TURBINE

George H. Heinold, Scotia, and Thomas R. Huber, Mechanicville, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 16, 1971, Ser. No. 208,840

Int. Cl. F01d *17/14*; F02c *3/00*

U.S. Cl. 415—152 **4 Claims**



A reversing gas turbine with two coaxial rows of oppositely curved rotor blade portions and having two rows of separately adjustable stator blades controlling flow of motive fluid alternately to the forward or reversing rotor blades. A flow path deflector at the outlet of the reversing blades seals the outlet therefrom when the rotor turns in the forward direction, and is pivotable to deflect reversing fluid flow into the exhaust path when the turbine reverses.

3,752,598

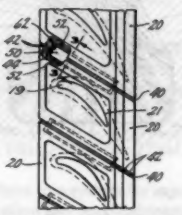
SEGMENTED DUCT SEAL

David A. Bowers, Madison, and Frank L. Detolla, Rockville, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Nov. 17, 1971, Ser. No. 199,552

Int. Cl. F01d *5/20*

U.S. Cl. 415—173 **5 Claims**



Confronting faces of a segmented duct of circular cross-section are provided with mutually opposing grooves running

transverse to the front plane of the duct, the grooves each having a tapered surface, the tapered surfaces of opposing grooves being in mutually facing relationship with each other. A thin flat rectangular plate bridges the gap between the tapered surfaces, having one of its longitudinal edges resting on each surface. A net force on the plate created for example by a pressure differential across the plate results in a seal between the tapered surfaces and each plate edge, thereby preventing the radial leakage of fluid through the gap between the segments.

3,752,599

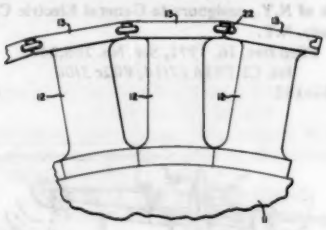
BUCKET VIBRATION DAMPING DEVICE

Edwin L. Pace, South Ashburnham, Mass., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 29, 1971, Ser. No. 128,761

Int. Cl. F01d *5/16*

U.S. Cl. 416—190 **1 Claim**



A bucket vibration damping device for a turbomachine including a composite button disposed between relatively vibratory, closely adjacent blade parts in a cutout having opposite portions formed in the closely adjacent opposing edge surfaces of the blade parts. When the turbo machine is operating, centrifugal forces thrust the button radially outward within the cutout so that the button will frictionally engage the adjacent blade parts to minimize relative vibrational movement. The geometry of the button is such that it tends to provide equal frictional forces on each blade part.

3,752,600

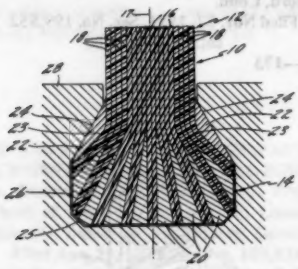
ROOT PADS FOR COMPOSITE BLADES

Thomas C. Walsh, New Britain, and David Street, East Granby, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Dec. 9, 1971, Ser. No. 206,426

Int. Cl. F01d *5/30*

U.S. Cl. 416—219 **2 Claims**



A composite filament reinforced rotor blade having a splayed root construction is provided with a pad on each side of the blade in the area of transition between the airfoil portion and root portion of the blade. The pad is designed to be wedged between the blade and its corresponding disc slot during rotor operation and to transmit blade centrifugal forces from the blade to the disc in such a manner so as to produce a compressive force on the surface of the blade in the transition area for preventing delamination of the filaments within the blade. In one embodiment of this invention, the pads on either side of the blade are connected by a flexible band closely fitting along the underside of the root portion to prevent metallic wedge-shaped inserts, which are sometimes used in the root, from being expelled therefrom.

3,752,601

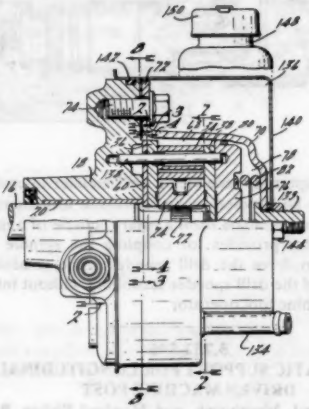
HIGH PRESSURE LIQUID PUMP

Jack Karagozian, Farmington, and William E. Rudnicki, Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sept. 22, 1971, Ser. No. 182,599

Int. Cl. F04b *49/08*

U.S. Cl. 417—300 **2 Claims**



A liquid pump adapted especially for use in a power steering system in an automotive vehicle comprising a pump rotor mounted for rotation within a cam ring, port plates and upper and lower seal plates arranged in axially stacked relationship and cooperating with a surrounding housing to define a pressure cavity on one side of the upper seal plate which is in fluid communication with the discharge port and the port plates, and an integral flow control and pressure relief valve assembly located in the housing independently of the pump rotor and cam ring in fluid communication with the discharge ports thereby providing a pump assembly of reduced axial dimensions and a pump flow and pressure control that has improved reliability.

3,752,602

OIL PUMP FOR HEATING INSTALLATIONS

Gunnar Lyshoj Hansen, and Jorgen Rono-Clausen, both of Nordborg, Denmark, assignors to Danfoss A/S, Nordberg, Denmark

Filed Aug. 11, 1971, Ser. No. 170,773

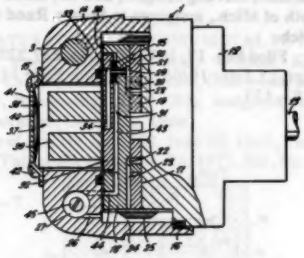
Claims priority, application Germany, June 26, 1971, P 21 31 857.0

Int. Cl. F04b *49/00*

U.S. Cl. 417—310 **4 Claims**

The invention relates to an oil pump assembly comprising a casing in which pumping elements are disposed and in which fluid intake and exhaust passages are formed. A bypass passage with valve means therein is between the intake and exhaust passages. An electromagnet is mounted in the casing and the armature thereof is associated with and operates the

valve means. The electromagnet is controlled jointly with the motor which drives the pump assembly in a manner such that the valve means are closed when pump assembly is operating and open when the pump assembly is turned off. The opening of the valve means in this manner permits pressurized fluid to



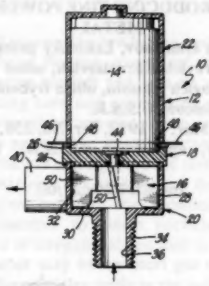
be bypassed to the intake passage such that the usual pressure regulating and cut-off valve connected to the exhaust or pressure outlet side will close instantaneously upon the motor being turned off by reason of the instantaneous reduction of pressure caused by the instantaneous bypassing of the pressuized fluid.

3,752,603

MOTOR DRIVEN CENTRIFUGAL PUMP

Robert E. Bunch, LaVerne, Calif., assignor to Zenith Manufacturing Inc., El Monte, Calif.

Filed Dec. 9, 1971, Ser. No. 206,256
Int. Cl. F04b *17/00*
U.S. Cl. 417—424 **4 Claims**



A motor driven centrifugal pump characterized by a unique housing, motor and impeller which provide the pump with a simple low-cost construction, compact size, quiet operation and other features that adapt the pump for use in a trailer, camper or the like for pumping water from a storage tank to a tap or other outlet.

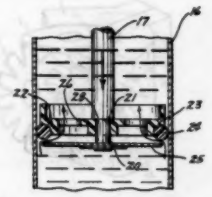
3,752,604

PUMP VALVE ASSEMBLY

Chester Dorn, Spencer, Iowa, assignor to Superior Manufacturing Company, Spencer, Iowa

Filed July 19, 1971, Ser. No. 163,633
Int. Cl. F04b *7/04*
U.S. Cl. 417—511 **6 Claims**

A barrel pump valve assembly including a piston slidably carried by a piston rod. An O-ring seal for contacting the pump cylinder wall is supported between the piston and a disc attached to the piston rod, and the O-ring and piston move longitudinally toward and away from the disc to close and open the valve, respectively. When the O-ring is away from



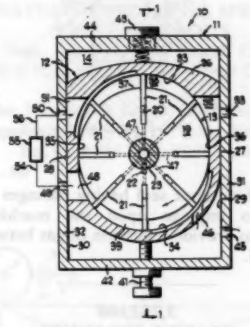
the disc, fluid can pass between the disc and O-ring and through openings in the piston, and when the O-ring is in contact with the disc, the valve is closed.

3,752,605

ROTARY GAS COMPRESSOR

Alwin B. Newton, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 17, 1971, Ser. No. 199,551
Int. Cl. F01c *1/30, 21/16;* F04c *25/00*
U.S. Cl. 418—8 **4 Claims**



A rotary gas compressor including a single vaned rotor positioned within a stator housing shaped to provide high and low pressure chambers, the housing and rotor being relatively movable to vary the sizes of the chambers. In one example, this construction can provide two-stage operation allowing the compressor to attain a high over-all pressure ratio. In a second example, the gas compressor is effective to provide high and low pressures to separate evaporators of a refrigeration system.

3,752,606

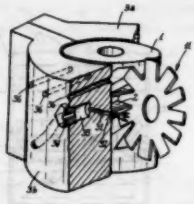
LIQUID INJECTION SYSTEM FOR GLOBOID-WORM COMPRESSOR

Bernard Zimmern, 27, rue Delabordere, Neuilly-sur-Seine, France

Filed Dec. 14, 1971, Ser. No. 207,804
Int. Cl. F01c *1/08;* F04c *17/04, 27/02*
U.S. Cl. 418—97 **8 Claims**

The invention relates to a system for injecting a liquid to ensure cooling, lubrication and leak-tightness in a globoid-worm compressor. In known systems the liquid is injected substantially parallel to the axis of the worm on the low pressure side of the compressor and in the vicinity of the pinions which

cooperate with the worm. According to the invention, the liquid injection system comprises ducts formed in the casing of the compressor and opening in the vicinity of the pinions in



the zone where the width of the crests of the worm threads is a minimum. Preferably the duct is oriented transversely to the plane of the pinions.

3,752,607

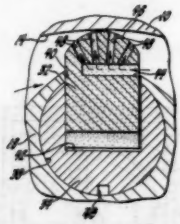
ROTARY MACHINE APEX SEAL

John Bilobran, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 6, 1972, Ser. No. 232,160

Int. Cl. F01c *19/04*

U.S. Cl. 418—124 **4 Claims**



A rotary machine apex seal having passages for directing gas pressure to impinge upon the machine's internal peripheral wall to provide a cushion of gas between the apex seal and this wall.

3,752,608

BEARING FOR PUMPS

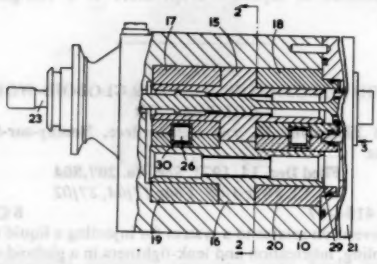
Martin Knowles, Bromsgrove, and Harold Lucas Tulloch, Solihull, both of England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Nov. 23, 1971, Ser. No. 201,438

Claims priority, application Great Britain, Nov. 28, 1970, 56,649/70

Int. Cl. F01c *19/08*

U.S. Cl. 418—131 **10 Claims**



A bearing arrangement for a gear pump has pairs of bearing elements on either side of a pair of meshed gears. The bearing elements lie in interpenetrating bores in the pump body and adjacent faces of the bearings are flat and are sealingly and adhesively secured together.

3,752,609

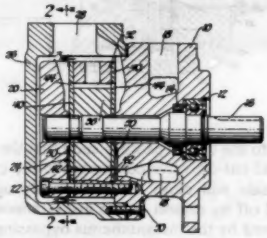
VANE PUMP WITH FLUID-BIASED END WALLS

Albin J. Niemiec, Sterling Heights, and Raymond B. Pettibone, Troy, both of Mich., assignors to Sperry Rand Corporation, Troy, Mich.

Filed Feb. 17, 1972, Ser. No. 227,227

Int. Cl. F01c *19/08*; F03c *3/00*; F04c *15/00*

U.S. Cl. 418—133 **4 Claims**



A balanced vane pump has a body supporting the driveshaft and clamping together the pumping cartridge. The cartridge includes an ovoid cam ring and a slotted rotor carrying radially slidable vanes. Flexible cheek plates are clamped against the cam ring and pressed toward the rotor and vanes by outlet pressure applied over limited areas defined by pressure pockets surrounding the outlet ports in the cheek plates.

3,752,610

DEVICE FOR PRODUCING FINE POWDER OF LIQUID METAL

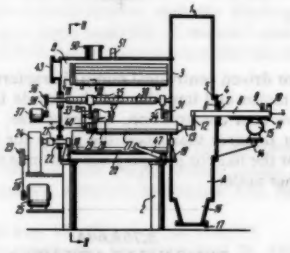
Sergei Georgievich Glazunov, Leninsky prospekt, 41, kv. 62; Leonid Alexandrovich Khrustsevich, ulitsa Kolesovoi, kv. 3, and Yury Fedorovich Altunin, ulitsa Dybenko, 22, korpus 6, kv. 511, all of Moscow, U.S.S.R.

Filed Mar. 1, 1972, Ser. No. 230,589

Claims priority, application U.S.S.R., Dec. 18, 1969, 1386012

Int. Cl. B29c *23/00*

U.S. Cl. 425—6 **5 Claims**



A device is disclosed for producing fine powder of liquid metal comprising an air-tight chamber which accommodates a nonconsumable and a consumable electrode with the latter being located on two horizontal rolls parallel to each other and connected so as to ensure their synchronous rotation with a rotary gear, the consumable electrode being held tight to the

rolls by two rollers one of which is in mesh with the electrode and is connected to a longitudinal feed gear to maintain constant spacing between the consumable and non-consumable electrode.

3,752,611

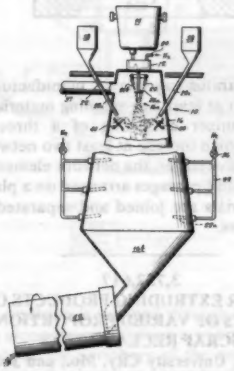
APPARATUS FOR PRODUCING METAL POWDER

William A. Reed, West Richfield; William K. Kinzer, Northfield Center; John J. Swanson, Lakewood, and Robert E. Kusner, Brecksville, all of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Division of Ser. No. 834,368, June 18, 1969, Pat. No. 3,655,837. This application Aug. 26, 1971, Ser. No. 175,407

Int. Cl. B22d *23/08*

U.S. Cl. 425—7 **6 Claims**



Apparatus and process for producing a powder from molten metal by forming a flowing stream of metal from a ladle through a regulating tundish and into an atomizing chamber having an atomizing zone and a collecting zone. An atomizing gas is directed through an annular nozzle or series of annularly disposed gas jets against the stream of molten metal to form metal particles, the gas exiting from the nozzle or jets at supersonic velocity. Matter is injected against the particles prior to atomization and/or between the atomizing and collecting zones of the chamber to cause particle agglomeratio to produce particles of irregular shape and to cool the particles. The injected matter may be an inert gas or fine particles of metal powder. The particles settle in the collecting zone where they are subsequently cooled and transported for further processing.

3,752,612

APPARATUS FOR THE CONTINUOUS PRODUCTION OF TUBULAR FILM FROM THERMOPLASTIC SYNTHETIC RESINS

Antony Van Duuren, Velp (Gld.), Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

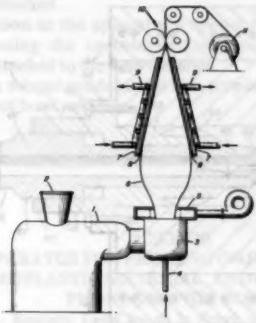
Filed May 18, 1971, Ser. No. 144,101

Claims priority, application Netherlands, June 3, 1970, 7008028

Int. Cl. B29c *1/04*; B29d *7/14*

U.S. Cl. 425—66 **1 Claim**

An apparatus for the production of wrinkle-free tubular films from thermoplastic synthetic resins is disclosed. The apparatus comprises an extruder, at least one guide surface, and haul-off rolls. The guide surface is covered with a layer of synthetic resin containing at least 0.5% glass fiber. The presence of the glass fiber in the synthetic resin produces a somewhat granular surface which minimizes or eliminates wrinkling in the extruded film.



3,752,613

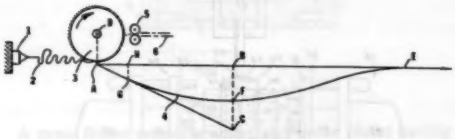
APPARATUS FOR PRODUCING SPRAY SPUN NONWOVEN SHEETS

Clifford M. Vogt, Madison, and Joseph C. Polise, Morris Plains, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Division of Ser. No. 96,040, Dec. 8, 1970, Pat. No. 3,689,342. This application May 24, 1972, Ser. No. 256,505

Int. Cl. B29d *7/00*; B29c *13/00*

U.S. Cl. 425—80 **3 Claims**



Spray-spun nonwoven sheets having improved physical properties are produced by spray spinning a fiber-forming polymer tangentially onto the surface of a sheet collection device. The randomness of the spray-spinning process provides a uniform sheet having both long and short filaments.

3,752,614

ADJUSTABLE EXTRUSION HEAD

Sherman L. Bremer, Tempe, Ariz., assignor to Bremertron KL Corporation, Tempe, Ariz.

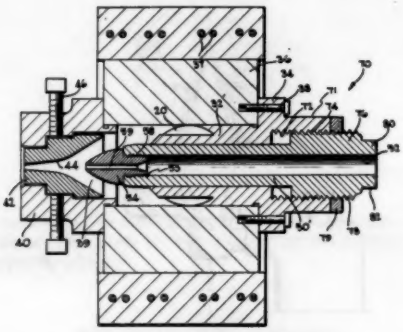
Filed Feb. 2, 1971, Ser. No. 111,911

Int. Cl. B29c *27/14*

U.S. Cl. 425—113 **4 Claims**

An extrusion head for forming insulated wire includes a fixed threaded hollow mandrel and a threaded hollow pin disposed internally of and in mating engagement with the mandrel for supporting a male die member in axial alignment with a female die member mounted within the head. The

threaded portions of the mandrel and the pin are so engaged that rotation of the pin within the mandrel advances or



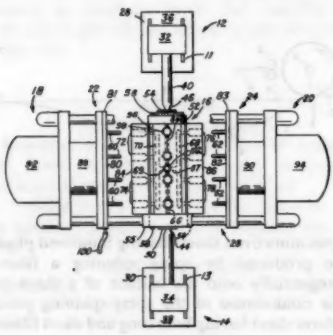
retracts the male die member with respect to the female die member while maintaining the alignment therebetween.

3,752,615

INJECTION MOLD/INJECTION BLOW MOLD SYSTEM

Dick T. Van Manen, 25 Holiday Harbour, Canandaigua, N.Y.

Filed June 15, 1971, Ser. No. 153,262
Int. Cl. B29d *23/03*
U.S. Cl. 425—130 10 Claims



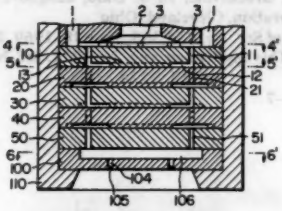
An injection mold/injection blow mold having a rotary manifold fed axially from either one, or optionally, two, axially movable injectors located at the respective ends of the manifold, through rotary, axial-slip joints, and having one or more clamps which reciprocate at an angle to the axis of the manifold to co-act in forming molded products of material dispensed through the manifold; sets of mold cavities in the manifold and corresponding sets of cores on each clamp are provided, and both one-direction-rotating and oscillating manifold motion are disclosed, the whole making possible simultaneous two-color and combined-color molding in low-radius, high speed manifold operation.

3,752,616

MIX-SPINNING APPARATUS

Masao Matsui, Takatsuki, and Masahiro Yamabe, Neyagawa, both of Japan, assignors to Kanegafuchi Boseki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 783,508, Dec. 13, 1968, Pat. No. 3,613,173. This application May 13, 1971, Ser. No. 143,217
Claims priority, application Japan, Dec. 20, 1967, 42/82022; Feb. 27, 1968, 43/12426
Int. Cl. D01d *3/00*
U.S. Cl. 425—131 6 Claims



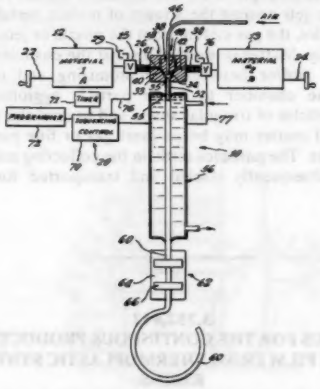
A spinning apparatus capable of manufacturing a multi-layer filament from at least two-spinning materials by using a layer-multiplying mixer consisting of a three-dimensional passage network which include at least two network elements arranged in successive stages, the network element being composed of repeated unit passages arranged on a plane, whereby the spinning materials are joined and separated in different phase in multi-stages.

3,752,617

APPARATUS FOR EXTRUDING PRODUCTS OF PLURAL COMPONENTS OF VARIED PROPORTIONS WITH SCRAP RECLAMATION

Norbert W. Burlis, University City, Mo., and Joseph H. Corbett, Fort Edward, N.Y., assignors to Sherwood Medical Industries Inc., St. Louis, Mo.

Continuation of Ser. No. 865,615, Oct. 13, 1969, abandoned. This application Mar. 3, 1972, Ser. No. 231,608
Int. Cl. B29 *3/01, 3/12*
U.S. Cl. 425—131 1 Claim



A method and apparatus for producing tubing having different characteristics, e.g. physical, chemical and the like, along its axial length including two or more extruders that feed different plastic materials to a mixing and extruding die with a sequencing control for decreasing or interrupting the flow from one extruder and simultaneously increasing the flow from one other extruder and after a predetermined time interval reversing this operation to produce a tube having repeating

different characteristics which tube may thereafter be cut into sections including portions containing each characteristic. In one embodiment a composite extrusion is employed with a control for increasing the flow of one plastic to one of the dies and for simultaneously and proportionally decreasing the flow to the other of the dies to produce a tube having gradually changing physical properties along its axial length while maintaining a uniform cross-section tube.

3,752,618

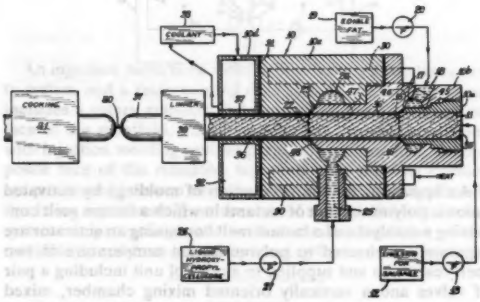
APPARATUS FOR CONTINUOUS SAUSAGE MANUFACTURE

Stephen T. Moreland, 789 Anita Ave., Grosse Pointe Woods, Mich.

Division of Ser. No. 46,975, June 17, 1970, Pat. No. 3,698,916. This application Mar. 31, 1972, Ser. No. 239,915

Int. Cl. A22c *11/02*

U.S. Cl. 425—133 **7 Claims**



A sausage emulsion is pumped through a passageway. At a first location along the passageway a water barrier material is introduced about the periphery of the emulsion. At a point downstream from that location a heat liquified casing forming material is introduced about the water barrier and solidified by cooling. Thereafter, the filled casing is handled conventionally.

3,752,619

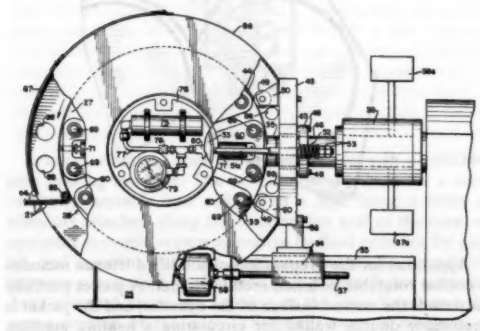
PRODUCTION OF A CONTINUOUS MOLDED PLASTIC STRIP

Marvin Menzin, Waltham; John H. Blanz, Concord; Andrew C. Harvey, Boston, and Sang Soon Rhee, Burlington, all of Mass., assignors to American Velcro Inc., New York, N.Y.

Division of Ser. No. 824,597, May 14, 1969, abandoned. This application Nov. 11, 1971, Ser. No. 198,002

Int. Cl. B29f *1/14*

U.S. Cl. 425—134 **21 Claims**



A continuous molded plastic strip is produced using mold plates which have cavities therein for molding upstanding members or pile-like formations when moldable plastic material is applied under suitable pressure. Thereafter, plastic material is applied to the exposed ends of the pile-like formations while still in the cavities and a strip constituting a base member is formed having the pile-like protuberances integrally attached.

In addition to the apparatus a special method is proposed for producing the upstanding formations or members integrally attached to the base member.

Certain related products are also proposed including a special form of hook member.

3,752,620

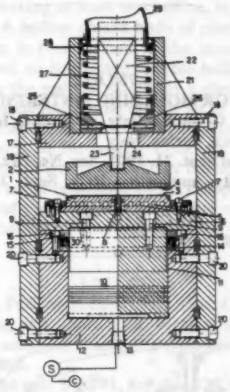
APPARATUS FOR PRESSING OBJECTS OUT OF THERMOPLASTIC MATERIAL, AND PARTICULARLY PHONOGRAPHIC DISKS

Robert A. Renoux, Les Cles de la Foret, 80, avenue, Lefebvre Poissy, France

Filed Oct. 18, 1971, Ser. No. 189,965

Int. Cl. B29c *3/06*; B06b *3/00*

U.S. Cl. 425—174.2 **8 Claims**



A press frame supports upper and lower plates having opposed surfaces with a pattern on each. The upper plate is secured to an ultrasonic vibration means, upward movement of which is resisted by resiliently flexible means. The lower plate is connected to a pressure fluid actuated device for urging, at a low or a high pressure, the lower plate against the upper plate when a plastic material is therebetween, thereby forming an impression in said material.

3,752,621

REMOVEABLE BLOW NEEDLE MECHANISM

Richard K. Shelby, Hinsdale, Ill., assignor to Monsanto Company, St. Louis, Mo.

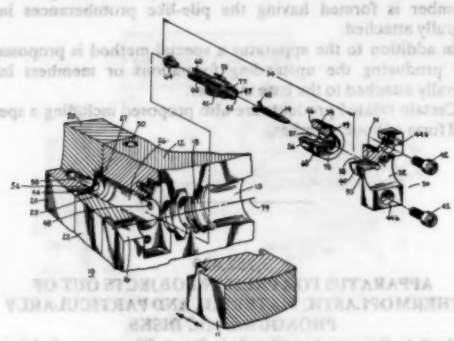
Filed May 6, 1971, Ser. No. 140,665

Int. Cl. B29d *23/03*

U.S. Cl. 425—192 **8 Claims**

Means are provided which permit rapidly extracting the needle assembly of a partible blow mold toward the mold axis through the bore of the mold section in which it is operable. These means include a stop member positioned in the bore for delimiting the advancing stroke of the needle assembly, such

member being detachably fastened through the face of the mold section. Improved means for automatically admitting



pressurized fluid to the hollow interior of the blow needle after penetration of the parison by the needle may also be provided.

3,752,622

DEVICE FOR MOULDING SINTERING BLANKS

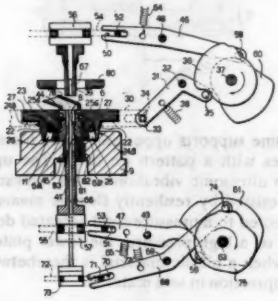
Sergio Viadana, Cremona, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivera, Torino, Italy

Filed Sept. 21, 1971, Ser. No. 182,352

Claims priority, application Italy, Sept. 22, 1970, 70185 A/70

Int. Cl. B29c 7/00, 3/00

U.S. Cl. 425—78 **10 Claims**



A device for moulding blanks with undercut parts to be sintered by compaction of powdered material. A two part die forms the chamber in which the blank is moulded. A pair of opposed punches pass through the die to compact the powdered material. The two parts of the die are held firmly in contact with one another during the stroke of the punches by an annular collar with inclined surface engaging oppositely inclined surfaces on the die. After the material has been compacted, the two parts of the die are separated in such a direction as not to interfere with the undercut portions of the blanks. After the die has opened, one of the punches retracts while the other continues its stroke to move the blank from between the two parts of the die.

3,752,623

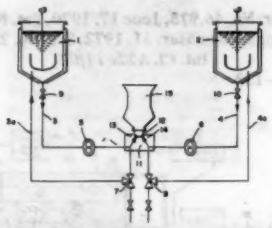
APPARATUS FOR PRODUCTION OF POLYAMIDE MOLDINGS

Richard Sinn, Ludwigshafen, and Rolf Schellenberg, Mannheim, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhein, Germany

Continuation of Ser. No. 803,299, Feb. 28, 1969, abandoned. This application July 14, 1971, Ser. No. 163,406

Int. Cl. B29b 1/04, 5/02; C08g 20/12

U.S. Cl. 425—206 **6 Claims**



An apparatus for the production of moldings by activated anionic polymerization of lactams in which a lactam melt containing a catalyst and a lactam melt containing an activator are separately preheated to polymerization temperature in two melt reservoirs and supplied to a control unit including a pair of valves and a vertically oriented mixing chamber, mixed therein, and forced upwardly into the mold to be filled wherein valve seats for the respective valves are in the wall of said mixing chamber.

3,752,624

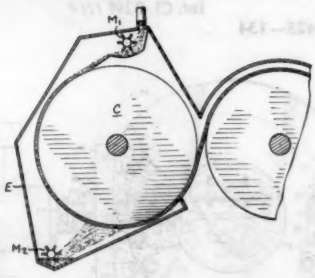
APPARATUS FOR THE PRODUCTION OF SOLIDIFIED TRIOXAN

Pierre Decitre, Bethune, France, assignor to Houilleres du Bassin du Nord & du Pas-de-Calais, Nord, France

Division of Ser. No. 675,835, Oct. 17, 1967, Pat. No. 3,590,110. This application May 14, 1971, Ser. No. 143,647

Int. Cl. B29d 7/00

U.S. Cl. 425—224 **6 Claims**



Apparatus for the preparation of solidified trioxan includes a cooled rotatable polished metal cylinder. A jacket partially surrounds the curved surface of the cylinder; and the jacket is preferably double walled for circulating a heating medium therethrough. An application is positioned to apply liquid trioxan to the surface of the cylinder where it solidifies and is subsequently removed therefrom.

3,752,625

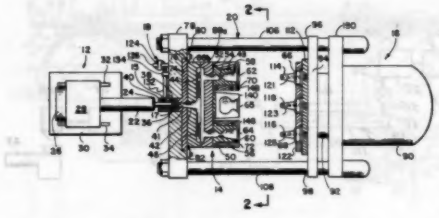
ROTARY PARAXIAL-CAVITY RECIPROCABLE-CORE INJECTION MOLD/INJECTION BLOW MOLD SYSTEM

Dick T. Van Manen, 25 Holiday Harbour, Canandaigua, N.Y.

Continuation-in-part of Ser. No. 153,262, June 15, 1971. This application Aug. 2, 1971, Ser. No. 168,284

Int. Cl. B29d *23/03*

U.S. Cl. 425—249 10 Claims



An injection mold/blow mold system having a rotative cavity-system and a reciprocating core system; the cavity-system includes a rotary manifold fed through an axial sprue in one face of the manifold, the sprue connects through sub-sprues with injection molding cavities paraxially positioned in the opposite face of the manifold. Injection blow molding cavities are positioned between the injection molding cavities, all cavities being equidistant from the axis of the manifold; the core-system reciprocates parallel with the axis of rotation of the manifold to and from the cavity bearing face.

3,752,626

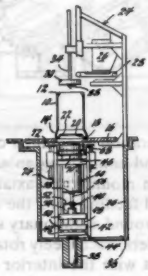
VIBRATORY CORE FOR CONCRETE PIPE MAKING MACHINE

Ferinand A. Trautner, Newton Upper Falls, Mass., and Le Roy E. Kent, Moville, Iowa, assignors to Viropac, Inc., Sioux City, Iowa

Continuation-in-part of Ser. No. 638,010, May 12, 1967, abandoned. This application Oct. 17, 1969, Ser. No. 867,344

Int. Cl. B28b *21/28*

U.S. Cl. 425—262 24 Claims



A novel vibrating core apparatus for use with a concrete pipe making machine. The novel apparatus includes a core, vertically movable into and out of a pipe form, a series of vibrators attached along the interior side wall of the core, an upwardly movable system operative by fluid pressure for raising and lowering the core, and an interlocking connection between a standard packerhead, which distributes cementitious material about the interior of the pipe form, and the upper portion of the core. The packerhead is designed to rotate while forming the pipe; the core does not rotate and the connecting means between the two is easily attached and disengaged from the packerhead.

3,752,627

DEVICE FOR MANUFACTURING A HOLLOW ARTICLE OF PLASTIC MATERIAL

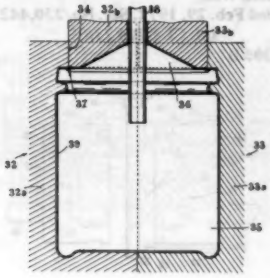
Jacques Bourgeois, Lyon, and Hubert Blanchard, Le Havre, both of France, assignors to Sidel Societe Anonyme, Le Havre, France

Filed Oct. 22, 1970, Ser. No. 83,002

Claims priority, application France, June 18, 1969, 6920327; Oct. 24, 1969, 6936695

Int. Cl. B29d *23/03*

U.S. Cl. 425—298 3 Claims



The invention relates to manufacturing a hollow article of plastic material having at least one orifice, in a mould having an inner cavity. A hollow closed body of plastic material in a deformable state is first formed in the inner mould cavity. Then, compressed air is injected into the hollow closed body, while forming in the walls of said body a closed line of lesser resistance corresponding to the orifice lip of the article to be manufactured. Finally, that portion of the inner mould cavity which corresponds to the article orifice is temporarily increased in volume, whereby the wall of the hollow body is cut along the line of lesser resistance by the compressed air acting on that portion of the body wall which lies within the closed line of lesser resistance.

3,752,628

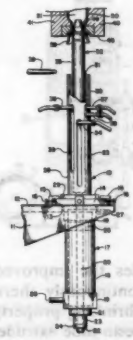
APPARATUS FOR MOLDING PLASTIC CONTAINERS

Robert X. Hafele, and Elmer L. Robertson, both of Overland Park, Kans., assignors to Ethyl Development Corporation, Kansas City, Mo.

Filed Apr. 5, 1971, Ser. No. 130,911

Int. Cl. B29d *23/03*

U.S. Cl. 425—302 B 9 Claims



An apparatus for blow molding hollow, thermoplastic containers having cylindrical neck openings. A blow pin assembly is provided which includes a cylindrical, retractable blow pin having an annular shoulder with a sharp edge adjacent its outer end which engages an anvil surface carried by the blow

mold to sever the neck waste from the plastic container. An annular groove is provided adjacent the cutting edge of the blow pin, which groove is filled by the heat-softened plastic material and, after cooling, provides a firm connection between the blow pin and the neck waste to assure that the neck waste material is severed and carried away from the plastic article upon retraction of the blow pin.

3,752,629

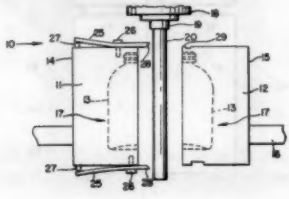
MOLD TRIM DEVICE

John Henry Gordon, Phoenixville, Pa., assignor to Beloit Corporation, Beloit, Wis.

Filed Feb. 29, 1972, Ser. No. 230,442

Int. Cl. B29d *23/03*

U.S. Cl. 425—305 B **6 Claims**



A parison cutting device mounted on a mold. A knife blade mounted on one mold half extends out beyond the face of that mold half and reacts resiliently against a surface on the other mold half to cut by a shearing action a parison extending into the mold between the knife blade and the reaction surface as the mold halves close against each other to form the single mold cavity. The blade angle may be selected to provide either a sealed or an opened parison.

3,752,630

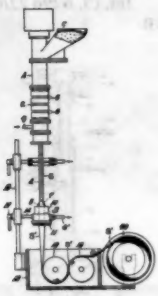
APPARATUS FOR CONTINUOUS PRODUCTION OF THERMOPLASTIC SYNTHETIC RESIN TUBE WITH HEAT-SHRINKING PROPERTY

Haruo Takagi, 9, Saiwaicho-dori, 5-chome, Naniwa-ku, Osaka, and Yasuo Yamagishi, 660 Shenke-cho, Sakai, both of Japan

Continuation of Ser. No. 840,942, July 11, 1969, abandoned. This application Jan. 5, 1972, Ser. No. 215,687

Int. Cl. B29d *23/04*

U.S. Cl. 425—325 **1 Claim**



This invention provides the improved method and apparatus of producing continuously thermoplastic synthetic resin tube with a heat-shrinking property, whereby a fresh thermoplastic synthetic resin tube extruded from an extruder is expanded by fitting same over a conical-topped cylindrical member of larger diameter while in a half-solidified state and wound onto a bobbin through take-up rolls after cooled down with suitable cooling devices. This type of tube is increasingly used as a film-covering or sealing material for dry cells, bamboo rods, bottle-caps, etc. because of it shrinking to the original diameter by heating.

3,752,631

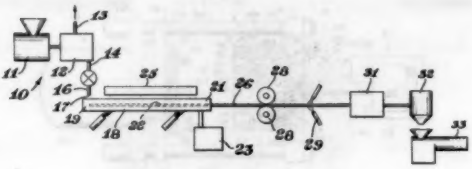
FOAM SCRAP RECOVERY AND APPARATUS

John M. Corbett, and James L. Fookes, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 22, 1971, Ser. No. 126,486

Int. Cl. B29b *1/00*

U.S. Cl. 425—324 **5 Claims**



Thermoplastic foam scrap is recovered as extrudable granules by grinding the scrap, passing it over a vibrating cooled trough, applying radiant heat to the scrap, cooling and grinding to provide an extrudable pellet or particle.

3,752,632

PRESS FOR FORMING GRANULAR MATERIAL

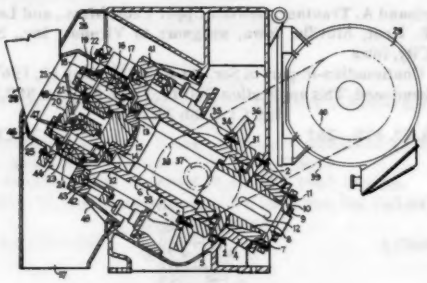
Theodorus Jacobus Heesen, Boxtel, Netherlands, assignor to Simon-Heesen N.V., Boxtel, Netherlands

Filed Oct. 14, 1971, Ser. No. 189,241

Claims priority, application Netherlands, Oct. 30, 1970, 7015940

Int. Cl. B29f *3/012*

U.S. Cl. 425—331 **5 Claims**



A press for the preparation of granular cattle feed or similar material and of the kind comprising an annular radially perforated die and a drum mounted co-axially with the die and provided with a central feeding port, the die and drum being mounted for rotation around a stationary support fitted with a number of pressure rollers, each freely rotatable on a stationary shaft and in contact with the interior of the die, characterised in that the angle of the axis of rotation of the die and the drum relative to a horizontal plane is approximately between 20° and 40°.

3,752,633

SEAL MANUFACTURING MACHINE

George Lundberg, Pompton Lakes, N.J., assignor to E. J. Brooks Company Incorporated, Newark, N.J.

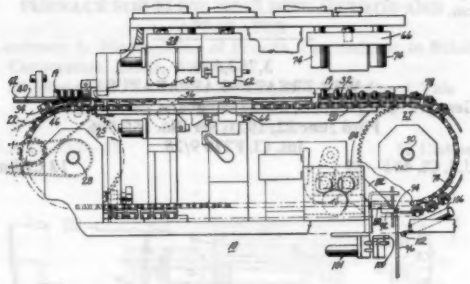
Filed July 7, 1971, Ser. No. 160,418

Int. Cl. B29c *3/04*

U.S. Cl. 425—343 **5 Claims**

A machine for performing secondary operations on previously molded plastic seal blanks. Conveyer means is provided for carrying the blanks in side by side aligned relation through

a number of work stations, one of which provides heated dies for closing a socket cup to non-removably receive a stud pro-



jecting from the other end of the seal. Means is provided at the end of the conveyer for receiving completed seals in groups of a predetermined number for packaging.

3,752,634

BURNER

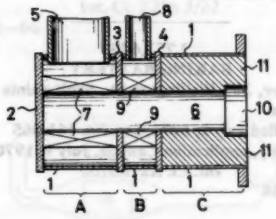
Tadami Imatake, Takasago; Hideo Nishikawa, Akashi; Akihito Kawaguchi, Kako, and Koichi Washimi, Iwaki, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha and Kureha Chemical Industry Company Limited

Filed Aug. 16, 1971, Ser. No. 172,066

Claims priority, application Japan, Aug. 18, 1970, 45/71899; Aug. 18, 1970, 45/81764

Int. Cl. F23d *15/02*

U.S. Cl. 431—353 **5 Claims**



The present invention relates to a burner, in which burning air given the power of rotation and a fuel given the power of rotation are mixed and the resulting mixture is burnt, characterized in that a step part for mixing air and fuel and igniting the mixture is formed of a ceramic material to improve the effect of flame maintenance. In addition with the above mentioned description, according to the present invention, a burner, which is equipped with a straight air nozzle for supplying a linear air flow along the axial center of the burner and in which the ignition face is stabilized is provided.

3,752,635

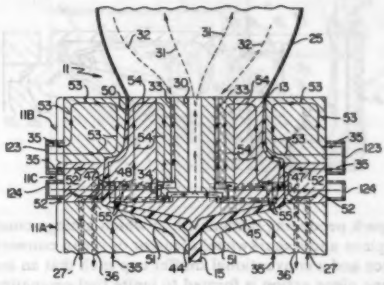
APPARATUS FOR MAKING PLASTIC FILM

Donald R. Hinrichs, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Mar. 22, 1971, Ser. No. 126,831

Int. Cl. B29c *1/00*

U.S. Cl. 425—461 **17 Claims**



Plastic film is made using a heat transfer liquid circulated through the film extrusion die to control (by either heating or cooling, as required) the temperature of the plastic melt flowing through such die. A plastic bubble emerging at the outlet of the die is inflated and ventilated by continuously circulated gas which is controlled in temperature as it enters and leaves the bubble so that it does not adversely affect the temperature of the melt in the die.

3,752,636

PHOTOFLASH LAMP

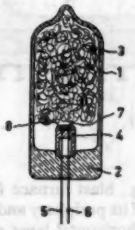
Heinz Warninck, Aumuhle bein Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 10, 1971, Ser. No. 197,395

Claims priority, application Germany, Nov. 27, 1970, P 20 58 441.2

Int. Cl. F21k *5/02*

U.S. Cl. 431—95 **1 Claim**



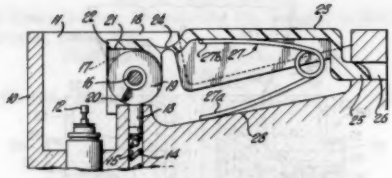
A photoflash lamp having an envelope includes a finely divided actinically combustible material and two current conducting wires which support an ignition mass within the envelope. The mass, which is ignitiable by passing a current through it, consists of an intimate mixture of a composition which burns upon heating and a powder of a satisfactorily conducting metal. The mass has a resistance in the order of $10^4\Omega$. In one form of the invention, the mass includes copper, silver or graphite as a satisfactorily conducting material.

3,752,637

UNITARY FINGERPIECE AND IGNITION ACTUATOR

David Norman, Sutton, and Keith Soane, Mickleham, both of England, assignors to Ronson Corporation, Woodbridge, N.J.

Continuation of Ser. No. 872,003, Oct. 29, 1969, abandoned.
This application Sept. 13, 1971, Ser. No. 180,071
Int. Cl. F23q 1/02
U.S. Cl. 431—274 7 Claims



A spark producing mechanism in which a hinge connects a fingerpiece and a sparkwheel actuator or it can connect a fingerpiece and a conventional snuffer cap such that an inexpensive, one piece action is formed to ignite fuel emanating from the burner valve of a cigarette lighter or the like.

ERRATUM

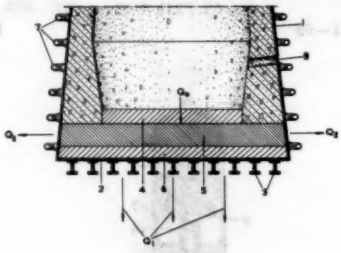
For Class 431—353 see:
Patent No. 3,752,634

3,752,638

BOTTOM OF A SHAFT FURNACE, A SHAFT FURNACE PROVIDED WITH SUCH A BOTTOM AND A METHOD FOR COOLING SUCH A BOTTOM

Jacobus Van Laar, Santpoort; Bastiaan Martinus Hoogendoorn, Heemskerk, both of Netherlands, and Karl Wilhelm Friedrich Etzel, Frankfurt am Main, Germany, assignors to Koninklyke Nederlandsche, Hoogovens En, Netherlands

Filed Dec. 17, 1971, Ser. No. 209,089
Claims priority, application Netherlands, Dec. 18, 1970, 7018539
Int. Cl. F27b 1/24
U.S. Cl. 432—4 15 Claims



A shaft furnace, e. g., blast furnace for iron manufacture, having liquid cooling of its periphery and air cooling of its bottom which contains a horizontal layer of refractory material with a heat conduction coefficient λ (cal/m/h/°C) which under operating conditions is higher than 20, includes the improvement that said layer is enclosed between upper and lower layers of refractory of much lower heat conducting coefficient λ. With the bottom surface cooled to below about 150° C, the thicknesses of said upper and lower layers, depending on their said coefficients, are preferably such that only 20 to 60 percent, more preferably 25 to 40 percent, of the heat discharge through the intermediate layer is transmitted to the lower layer; the periphery of the bottom being kept at about 50° C. The intermediate layer may consist of graphite with a λ-value of 60 to 100; the lower, of refractory e. g., carbon bricks, of a λ-vslue of 2 to 5; and the upper layer of refractory, e. g., semigraphite, may have a λ-value of 20 to 30.

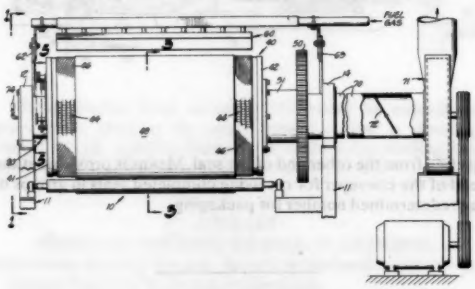
In particular embodiments the three layers, from top to bottom may have λ-values of about 25, 80 and 4, and thicknesses about 60, 120 and 60 cm, and the upper layer may be shielded by a top layer, e. g., of magnesite of a thickness of about 35 cm.

3,752,639

WEB TREATING APPARATUS

George F. Thagard, Jr., 10024 Pangburn, Downey, Calif.

Filed June 22, 1971, Ser. No. 155,506
Int. Cl. F27b 9/28
U.S. Cl. 432—59 12 Claims



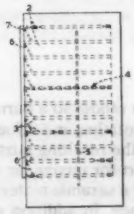
Web treating apparatus comprises an elongated tubular core fixedly mounted between supports, the core being closed at one end and having longitudinally extending perforations, the interior of the core constituting a vacuum manifold. A drum of circular cross-section and having a perforated circumferential wall is rotatably mounted coaxially with the core. The drum is adapted to receive a continuous web wrapped about a predetermined arcuate segment of its circumferential wall. High intensity heat generators are spaced radially outwardly of the drum and are disposed above at least a substantial portion of the predetermined arcuate segment. Vacuum exhaust means draw heated air through the web and the drum and into the vacuum manifold, and means disposed within the drum direct the flow of heated air exclusively and substantially uniformly through the portion of the web which is wrapped about the predetermined arcuate segment of the circumferential wall of the drum.

3,752,640

BAKING BATTERY

Frank Schneider, 309 Wellington St., Sault Sainte Marie, Ontario, Canada

Filed July 9, 1971, Ser. No. 161,065
Claims priority, application Canada, July 9, 1970, 087,771
Int. Cl. A21b 3/00
U.S. Cl. 432—56 2 Claims



The invention relates to a battery of substantially closed and insulated baking ovens each having a normally closed hinged

door which is hinged inwardly when a wheeled rack is located adjacent the battery and the baking trays on the rack are pushed into engagement with the doors and into the ovens.

3,752,641

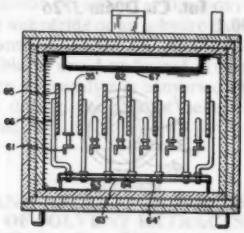
FURNACE FOR BLOW MOULDING METHOD AND APPARATUS

Lawrence A. Moore, King of Prussia, Pa., assignor to Beloit Corporation, Beloit, Wis.

Division of Ser. No. 3,003, Jan. 15, 1970, abandoned. This application July 28, 1972, Ser. No. 276,056

Int. Cl. F27b *9/24*

U.S. Cl. 432—57 **13 Claims**



An improved oven for heating elongated articles such as parisons just prior to blow molding. Air is heated externally of the oven and blown uniformly therethrough as the elongated articles travel continuously back and forth through the oven.

3,752,642

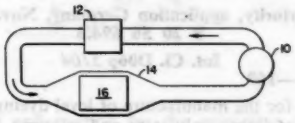
APPARATUS FOR BRAZING

James R. Early, Hawthorne; William M. Eyring, Redondo Beach; Donald W. McGrath, and Toshio Takenaka, both of Torrance, all of Calif., assignors to The Garrett Corporation, Los Angles, Calif.

Division of Ser. No. 805,502, March 10, 1969, Pat. No. 3,685,139. This application Nov. 15, 1971, Ser. No. 198,906

Int. Cl. F27b *3/22*

U.S. Cl. 432—66 **22 Claims**



The brazing of materials by means of a flow of heated gas.

3,752,643

PORTABLE GAS FIRED ART POTTERY KILN AND METHOD

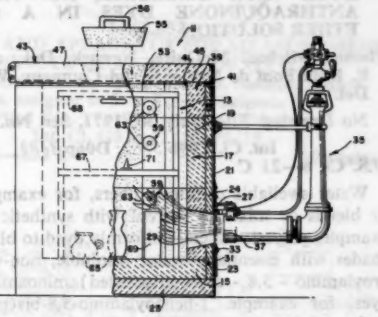
Worden Robinson, 715 18th St., Washington, D.C.

Filed Dec. 27, 1971, Ser. No. 212,445

Int. Cl. F27b *3/02*

U.S. Cl. 432—120 **7 Claims**

A gas fired pottery kiln having a furnace chamber defined by a floor and an upwardly extending wall suspended within a substantially cylindrical steel shell. The furnace chamber is spaced from the bottom of the shell and supported upon insulation material. The furnace chamber wall is spaced from the



steel shell, the space being filled by a refractory castable for securing the furnace chamber and providing compensation for expansion and contraction due to rapid heating and cooling.

3,752,644

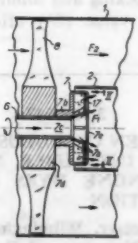
HOT AIR GENERATOR USING A GASEOUS FUEL

Louis Henri Pierre Arnal, La Celle-Saint-Cloud, France, assignor to Societe Anonyme Sefacal, Paris, France

Filed Dec. 23, 1971, Ser. No. 211,391

Int. Cl. F23l *5/02*

U.S. Cl. 432—222 **11 Claims**



A hot air generator using a gaseous fuel. The generator comprising a tubular body carrying air to be heated, a mixing tube carrying gaseous fuel and primary air to a burner located at the downstream end of the mixing tube. Radially fins or blades are disposed in the burner constituting a centrifugal fan. A combustion chamber is generally coaxially arranged in the tubular body generally downstream of the centrifugal fan means. The downstream wall of the burner formed by a heat grid permitting the passage of the fuel mixture for forming a flame on its surface.

3,752,645

WATER SWOLLEN CELLULOSE AND BLENDS DYED WITH INSOLUBLE, NON-VATTABLE ANTHRAQUINONE DYES IN A GLYCOL ETHER SOLUTION

Thomas Michael McGuire, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed July 30, 1971, Ser. No. 167,830

Int. Cl. C09b 5/62; D06p 3/82

U.S. Cl. 8—21 C 10 Claims

Water swellable cellulosic fibers, for example, cotton, or blends or mixtures thereof with synthetic fibers, for example, polyester fibers, uniformly dyed to blue to green shades with essentially water insoluble, non-vattable, 1-aroylamino - 5,8 - di(N-substituted)aminoanthraquinone dyes, for example, 1-benzoylamino-5,8-bis(p-toluidino) anthraquinone, said dyed fibers being fast to washing, drycleaning and sublimation and exhibiting a reflectance color value (S') after scour of at least about 2.

3,752,646

WATER SWOLLEN CELLULOSE AND BLENDS DYED WITH INSOLUBLE, NON-VATTABLE ANTHRAQUINONE DYED IN A GLYCOL ETHER SOLUTION

John Blackwell, Kennett Square, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed July 30, 1971, Ser. No. 167,831

Int. Cl. C09b 5/62; D06p 3/82

U.S. Cl. 8—21 C 7 Claims

Water swellable cellulosic fibers, for example, cotton, or blends or mixtures thereof with synthetic fibers, for example, polyester fibers, uniformly dyed to violet to green shades with essentially water insoluble, non-vattable, 1-aroylamino-4-arylaminoanthraquinone dyes, for example, 1-(p-nitrobenzoyl)amino-4-(p-n-butylanilino)anthraquinone, said dyed fibers having excellent fastness to washing, drycleaning, crocking and sublimation and exhibiting a reflectance color value (S^1) after scour of at least about 2.

3,752,647

WATER SWOLLEN CELLULOSE AND BLENDS DYED WITH INSOLUBLE, NON-VATTABLE ANTHRAQUINONE DYES IN A GLYCOL ETHER SOLUTION

Robert George Mentzer, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed July 30, 1971, Ser. No. 167,829

Int. Cl. C09b 5/62; D06p 3/82

U.S. Cl. 8—21 C 9 Claims

Water swellable cellulosic fibers, for example, cotton, or blends or mixtures thereof with synthetic fibers, for example, polyester fibers, uniformly dyed to blue shades with essentially water insoluble N,N',N''-substituted-1,4,5-(or 8-)-triaminoanthraquinone dyes, for example, 1-benzamido-4,5-bis(p-toluidino)anthraquinone, said dyed fibers being fast to light, washing, drycleaning, crocking and sublimation.

3,752,648

PROCESS FOR IMPROVING ACRYLIC FIBER ARTICLES

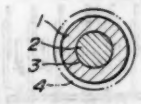
Yoshihisa Shichijo, Tokyo, Hiroyuki Yamaguchi, Kyoto, Katsuyoshi Tsuji, Osaka, and Kenji Maki, Kyoto, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of abandoned application Ser. No. 665,838, Sept. 6, 1967. This application Nov. 25, 1970, Ser. No. 92,901

Claims priority, application Japan, Sept. 10, 1966, 41/59,462; May 17, 1967, 42/30,884

Int. Cl. D06m 3/26

U.S. Cl. 8—130.1 7 Claims



An acrylic fiber article is treated with a solvent for said fiber in a manner such that the swelling and dissolving actions of said solvent act on a portion of the cross section of the individual fibers and then treating the resultant article with a treating agent consisting of said solvent, of which the concentration, temperature and treating time have been adjusted so as to dissolve or disperse only those layers of the fibers on which the solvent has acted to remove said layers therefrom.

3,752,649

DYE LEVELLING ON AND OLIGOMER REMOVAL FROM POLYESTER FIBERS AND CELLULOSE OR POLYAMIDE BLENDS WITH FATTY ACID DI-ESTER OF BUTANEDIOL-ETHYLENE OXIDE CONDENSATE

Otto Smerz, Kelkheim, Taunus, Gerhard Weckler, Sulzbach, Taunus, Alfred Scharf, Frankfurt am Main, and Werner Linke, Sulzbach, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Nov. 17, 1971, Ser. No. 199,748

Claims priority, application Germany, Nov. 18, 1970, P 20 56 694.3

Int. Cl. D06p 5/04

U.S. Cl. 8—169 9 Claims

Process for the manufacture of level dyeings on fibrous materials of linear polyesters and mixtures thereof with cellulose- or nitrogen-containing fibers, wherein the dyeings are carried out in the presence of compounds of the general formula

$$R_1—CO—(OC_2H_4)_n—O—C_4H_8—O—(C_2H_4O)_m—CO—R_2$$

in which $R_1—CO—$ and $R_2—CO—$ are radicals of straight chain or branched alkane- or alkene-monocarboxylic acids having 12 to 22 carbon atoms, and n and m each represent numbers from 4 to 12, or dyeings produced without using this auxiliary agent are aftertreated therewith and/or this auxiliary agent is added after the dyeing in the following reducing cleaning process.

3,752,650

DURABLE PRESS TREATMENT OF CELLULOSIC TEXTILES EMPLOYING A POLY-HYDROXY MONOCARBOXYLIC ACID CATALYST

Kurt Joss, Bergli, Weesen, St. Gall, and Ernst Ruedi, Wartegg, Ennenda, Glarus, Switzerland, assignors to Burlington Industries, Inc., Greensboro, N.C.

No Drawing. Continuation of abandoned application Ser. No. 613,435, Feb. 2, 1967. This application Oct. 15, 1970, Ser. No. 81,160

Claims priority, application Switzerland, Feb. 7, 1966, 1,655/66; June 1, 1966, 7,981/66

Int. Cl. D06m *13/12, 13/34*

U.S. Cl. 8—183 6 Claims

A process for providing a durable press finish on a cellulosic textile using, as the catalyst, a mono- or poly-hydroxymonocarboxylic acid which has at least one hydroxy group in the γ- or δ-position and forms a nonvolatile lactone upon removal of water, a dicarboxylic acid which forms an inner anhydride or an α-hydroxy monocarboxylic acid which forms a lactide on removal of water. This makes it possible to avoid undesired premature curing of the textile since the catalyst is converted to an essentially inert form on drying, the catalyst being reformed when curing is desired.

3,752,651

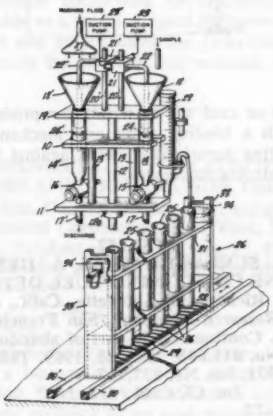
METHOD AND APPARATUS FOR EXTRACTION OF SOLVENT EXTRACTS

Ian E. Bush, Oyster Bay, N.Y., assignor to Cybertek, Inc., New York, N.Y.

Filed Apr. 15, 1971, Ser. No. 134,314

Int. Cl. B01d *11/00;* G01n *1/14*

U.S. Cl. 23—230 R 11 Claims



Apparatus and method for the extraction of solvent extracts are disclosed. First, a plurality of test tubes mounted on a movable rack are filled sequentially with a prespecified volume of liquid sample from a two-stage sample dispenser. One stage of the dispenser dispenses a sample while the other stage automatically and concurrently is cleaned; then the stages are reversed for the next specimen and the rack is moved on incremental distance to place an empty test tube under the cleaned dispenser. A prespecified volume of extracting solvent is then added to each sample by a second dispenser and the tubes are sealed by a multi-stopper apparatus. After agitation and settling, the solvent layers in each test tube are removed simultaneously by a ganged suction apparatus. For final reduction and extraction, the rack is placed in a ganged multiple-rotary evaporator apparatus wherein the sample is heated, rotated, and evaporated to form a residue. In another embodiment, wherein solid samples or drying agents are utilized, the sample is filtered prior to final reduction by a ganged multifilter apparatus.

3,752,652

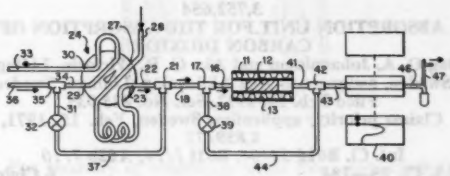
METHOD AND APPARATUS FOR MEASUREMENT OF MINUTE QUANTITIES OF OXYGEN

Walter Ferdinand de Vleesschauwer, Sluiskil, Netherlands, assignor to S.A. Texaco Belgium N.V.

Filed Feb. 11, 1972, Ser. No. 225,486

Int. Cl. G01n *27/16, 27/18*

U.S. Cl. 23—232 E 10 Claims



Method or system for measuring minute quantities of oxygen in a mixture with inert gas. A sample is passed over a reduced hydrogenation catalyst to react the oxygen with adsorbed hydrogen. Then hydrogen is passed over the catalyst while measuring the quantity of hydrogen used in reducing and saturating the catalyst once more. The quantity of oxygen in the sample is then determined by the stoichiometric relation between hydrogen and oxygen.

3,752,653

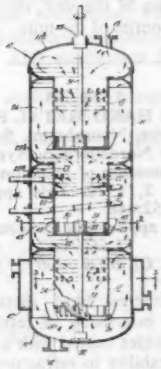
CONTINUOUS-FLOW AGITATED REACTOR

Arthur Phineas Weber, New York, N.Y., assignor to The Bethlehem Corporation, Bethlehem, Pa.

Filed Nov. 12, 1971, Ser. No. 198,301

Int. Cl. B01j *1/00;* C08f *1/98*

U.S. Cl. 23—283 9 Claims



A hollow elongated shell having an inlet and an outlet at opposite ends has a series of agitating assemblies mounted at axially-spaced locations in the shell. Each agitating assembly includes a hollow draft tube having

inlet port means at one end communicating with the corresponding end of an annular flow passage between the draft tube and shell and outlet port means at the opposite end communicating with the other end of the passage. An impeller is mounted for rotation in the draft tube adjacent the outlet port means to flow the process ingredients axially through the draft tube and outwardly through the outlet ports where the ingredients are mixed with ingredients flowing into the other end of the passage. Baffle means is associated with the outlet ports to redirect the flow of the reacted ingredients after they exit the outlet ports and to break up any swirl caused by the impeller. The impeller and baffle means cooperate to provide hydraulic and mechanical shear forces on the ingredients to improve reaction in the apparatus.

3,752,654

ABSORPTION UNIT FOR THE ABSORPTION OF CARBON DIOXIDE

Dag O. A. Johannisson and Ake G. R. Wictorin, Lidingo, Sweden, assignors to Aga Aktiebolag, Lidingo, Sweden

Filed Feb. 10, 1972, Ser. No. 225,035
Claims priority, application Sweden, Feb. 15, 1971, 1,859/71
Int. Cl. B01d *53/04*; B01j *1/14*; A62b *7/10*
U.S. Cl. 23—284 6 Claims

In an absorption unit for the absorption of carbon dioxide, especially for a breathing apparatus having a substantially closed gas system the space inside the unit is divided in a plurality of chambers, each one of which is filled with a carbon dioxide absorbing substance and bounded by walls of a porous material permitting the gas to pass from an inlet of the unit, through the walls and the substance to an outlet of the unit.

3,752,655

SINTERED HARD METAL PRODUCT

Lars Henry Ramqvist, Nynashamn, Sweden, assignor to Rederiaktiebolaget Nordstjernan, Nynashamn, Sweden

No Drawing. Continuation of abandoned application Ser. No. 7,970, Feb. 2, 1970. This application June 11, 1971, Ser. No. 152,448
Claims priority, application Sweden, Feb. 7, 1969, 1,660/69
Int. Cl. B22f *1/00, 3/12*
U.S. Cl. 29—182.5 31 Claims

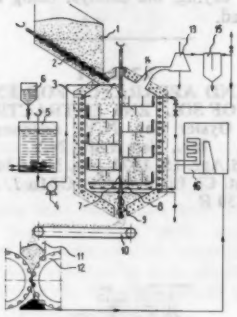
An improved sintered hard metal composition is provided comprised essentially of refractory metal compound grains or particles coated with a refractory carbide layer to impart wettability to refractory metal compound grains which are difficult to wet with such binder metals as the iron group metals. The wettable refractory carbide coating is formed by depositing a layer of the corresponding refractory metal upon the grains from a halide of the metal, which layer is thereafter carburized; or the carbide coating may be produced simultaneously on the surface of the grains from an atmosphere comprising halide vapor in the presence of a carburizing agent, in which hydrogen may or may not be present. The coated refractory metal compound grains may optionally be mixed with wettable refractory metal carbide grains in producing sintered hard metal compositions.

3,752,656

METHOD OF FORMING OF THE WET FINES AND COAL SILTS AND AN EQUIPMENT SUITABLE FOR APPLYING THE METHOD

Marian Rutkowski and Jadwiga Wieckowska, Wroclaw, Poland, assignors to Politechnika Wroclawska, Wroclaw, Poland

Filed Feb. 10, 1971, Ser. No. 114,248
Claims priority, application Poland, Mar. 2, 1970, P 139,125
Int. Cl. C10l *5/22*; B30b *11/00*
U.S. Cl. 44—2 2 Claims



Coal fines or coal silt materials comprising water are admixed with a binding agent and mechanically mixed while subjecting superheated steam against the direction of the coal mixture movement.

3,752,657

NONIONIC SURFACTANT AS A DEMULSIFIER FOR AMINE CONTAINING FUEL DETERGENTS

Wallace L. Richardson, Lafayette, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Continuation-in-part of abandoned application Ser. No. 811,648, Mar. 28, 1969. This application Apr. 26, 1971, Ser. No. 137,707
Int. Cl. C10l *1/18, 1/22*
U.S. Cl. 44—72 5 Claims

Distillate fuels having hydrocarbon polyamine fuel detergents in combination with a polyalkylene modified methylene bridged poly(alkylphenol) have improved water tolerance.

3,752,658

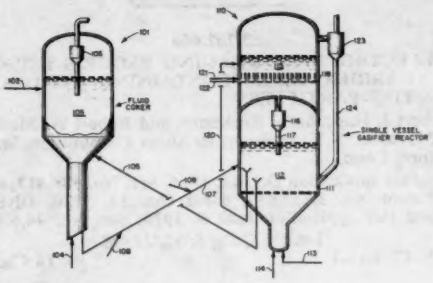
INTEGRATED FLUID COKING-GASIFICATION PROCESS

Don E. Blaser, Dover, N.J., assignor to Esso Research and Engineering Company

Filed Jan. 6, 1971, Ser. No. 104,281
Int. Cl. C10g *9/28*; C10j *3/00, 3/20*
U.S. Cl. 48—206 6 Claims

A process for producing fuel gas whereby coke from a conventional fluid coker is reacted with an oxygen-containing gas in a low temperature zone located in the lower portion of a single vessel reactor to produce flue gas, and then reacting the flue gas along with steam and

air or oxygen with coke which has been transferred from the low temperature zone to a high temperature zone



located in the upper portion of the single vessel reactor to produce fuel gas.

3,752,659

(ALKYLTHIO)ALKYL MERCAPTANS AS GAS ODORANTS

Willie W. Crouch and Ralph P. Williams, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Filed Dec. 10, 1971, Ser. No. 206,863

Int. Cl. C10l *3/00*

U.S. Cl. 48—197 FM **12 Claims**

A gas odorant comprising an (alkylthio)alkyl mercaptan, suitable as a warning agent for gaseous hydrocarbon fuels. In one embodiment the (alkylthio)alkyl mercaptan enhances the effect of conventional odorant mixtures.

3,752,660

CHLOROPHENOXYACETYLOXAZOLIDONE HERBICIDES AND PREPARATION THEREOF

Edwin D. Little, Convent Station, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

No Drawing. Original application Aug. 27, 1968, Ser. No. 755,743. Divided and this application Mar. 15, 1971, Ser. No. 124,606

Int. Cl. A01n *9/22*

U.S. Cl. 71—88 **1 Claim**

3-(chlorophenoxyacetyl)-2-oxazolidones are prepared by reacting a 2-oxazolidone with a chlorinated phenoxyacetyl chloride. When the oxazolidone is unsubstituted in the 5-position, presence of an acid acceptor is helpful to improve yield. The products are useful as herbicides.

3,752,661

DINITROPHENYLAZIDES AS HERBICIDES AND THEIR PREPARATION

Michael J. Orlett, Portsmouth, Ohio, assignor to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Continuation-in-part of abandoned application Ser. No. 760,687, Sept. 18, 1968. This application May 25, 1970, Ser. No. 40,398

Int. Cl. A01n *9/20, 13/00*

U.S. Cl. 71—125 **9 Claims**

2,6-dinitrophenylazides, useful as herbicides and as microbiocides are disclosed as is a process utilizing them as intermediates in the preparation of dinitroaniline-type herbicides.

3,752,662

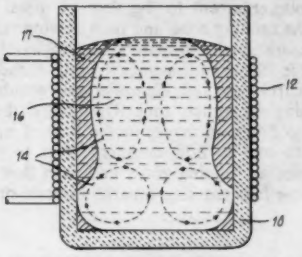
RECOVERY OF METAL FROM GLASS CLOTH FILTERS AND THE LIKE

Han Spoel, St. Cesaire, Quebec, Canada, assignor to Alcan Research and Development Limited, Montreal, Quebec, Canada

Filed Jan. 8, 1971, Ser. No. 104,962

Int. Cl. C22d *7/02*

U.S. Cl. 75—10 R **10 Claims**



For recovery of aluminum metal from glass cloth that has been used to filter the metal and has become at least partially coated therewith, the coated glass cloth is introduced to a heel of molten aluminum in an induction furnace, together with an amount of salt flux at least equal in weight to the nonmetallic content (including the glass cloth) of the coated cloth while the heel is continuously heated and circulated by electrical induction. The metal coating the cloth melts and coalesces with the heel, while the glass cloth is broken up by the circulation of the metal heel and becomes mixed with the flux. When the operation is completed and current supply to the furnace is shut off, the flux and other nonmetallics including the partially disintegrated glass cloth separate from the metal of the heel as a discrete and readily removable layer. The metal from the cloth, having become mixed with and augmented the heel, is recovered by withdrawing from the furnace at least part of the molten heel.

3,752,663

CONTINUOUS PRODUCTION OF LIQUID STEEL USING ARC FURNACES

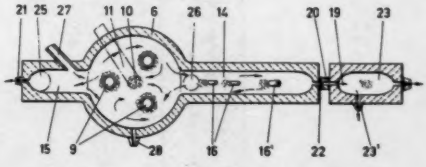
Howard Knox Worner, North Balwyn, Victoria, and Ronald Siddons, Cardiff Heights, Newcastle, New South Wales, Australia, assignors to Conzinc Riotinto of Australia Limited, Melbourne, Victoria, Australia

Continuation of abandoned application Ser. No. 684,814, Nov. 21, 1967. This application Sept. 23, 1970, Ser. No. 74,834

Claims priority, application Australia, Nov. 28, 1966, 14,483/66

Int. Cl. C21c *5/52*; H05b *7/18*

U.S. Cl. 75—12 **16 Claims**



A continuous smelting-refining process comprising feeding pre-heated and pre-reduced oxidic ores in agglomerated or particulate form into an electric furnace, the smelting and refining being effected substantially in a horizontal plane in a single integrated arc furnace having

an arc melting-smelting zone, an elongated refining zone, and a slag separation zone, the said zones being separate but in communication; feeding the oxidic ores continuously into the melting-smelting zone; maintaining the molten material in the melting-smelting zone in a state of turbulence; effecting electrical induction stirring of the molten material in the melting-smelting zone in order to maintain said material in a state of circulation, flowing unrefined metal from the melting-smelting zone to the refining zone, subjecting the unrefined metal in the refining zone to lancing with oxygen-containing gas, flowing the slag countercurrent to the flow of metal in at least a part of the refining zone and then flowing said slag into the slag separation zone, maintaining relatively quiescent conditions in the slag separation zone withdrawing refined metal from the refining zone, and withdrawing slag from the slag separation zone. Optionally, the slag may be caused to flow concurrent to the flow of metal in one refining zone and to flow countercurrent to the flow of metal in another refining zone, and then flow from said refining zones into the slag separation zone or zones.

3,752,664

METALLIC SOUND CONDUCTOR OR SOUND RADIATOR

Samuel Steinemann, Liestal, Switzerland, assignor to Institut Dr. Ing. Reinhard Straumann AG, Waldemburg, Switzerland

Filed Oct. 27, 1970, Ser. No. 84,308
Claims priority, application Switzerland, July 13, 1970, 10,571/70
Int. Cl. C22c *1/00*
U.S. Cl. 75—134 N **6 Claims**

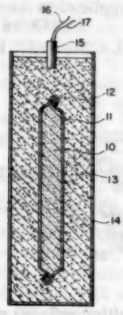
A metallic sound transmitter or sound radiator combines the low attenuation of a polycrystalline material with the malleability of a metal. The attenuation coefficient is seen to be determined by sound scattering in polycrystalline metals as a consequence of elastic anisotropy which in turn is determined by an electronic property in an alloy, so that a low coefficient can be obtained by providing alloys of predetermined composition which have the appropriate electron per atom ratio.

3,752,665

SYNTHESIS OF SUPERCONDUCTING COMPOUNDS BY EXPLOSIVE COMPACTION OF POWDERS

Upendra Roy, Guenther H. Otto, and Orvil Y. Reece, Huntsville, Ala., assignors to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed July 8, 1971, Ser. No. 160,860
Int. Cl. B22f *3/08*
U.S. Cl. 75—135 **7 Claims**



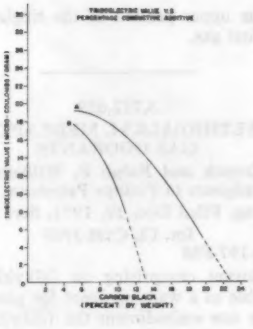
Superconducting intermetallic compounds such as Nb_3Sn are prepared by disposing a finely divided, stoichiometric mixture of elemental metal powders in a container, surrounding the container with an explosive and detonating the explosive. The resulting explosive shock wave provides the necessary reaction conditions for compound formation.

3,752,666

ELECTROSTATIC IMAGING PROCESS USING CARRIER BEADS CONTAINING CONDUCTIVE PARTICLES

Robert J. Hagenbach, Rochester, and Robert W. Madrid, Macedon, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Original application Oct. 11, 1966, Ser. No. 585,817, now Patent No. 3,533,835, dated Oct. 13, 1970. Divided and this application June 9, 1970, Ser. No. 44,676
Int. Cl. G03g *5/02, 13/08*
U.S. Cl. 96—1 **14 Claims**



Electrostatic latent images are developed with an electrostatographic developer mixture comprising finely-divided toner particles electrostatically clinging to the surface of grossly larger carrier particles, each of the carrier particles comprising a matrix material adjacent to at least the external surface of the carrier particle, the matrix containing solid finely-divided electrically conductive particulate material.

3,752,667

METHOD FOR DIRECTLY RECORDING LIGHT PATTERNS

Anthony D'Onofrio, West Hartford, Conn., assignor to Litton Business Systems, Inc., New York, N.Y.

Continuation-in-part of abandoned application Ser. No. 722,925, Apr. 22, 1968. This application Oct. 1, 1971, Ser. No. 185,863
Int. Cl. G03g *17/00*
U.S. Cl. 96—1 E **9 Claims**

A method for directly producing visible reproductions of light patterns in heat sensitive record sheet material. The record sheet material is placed contiguous to a photoconductive plate and is dielectrically heated to recording temperature opposite areas of the photoconductive plate exposed to light pattern intensities of predetermined magnitude by potential gradients resulting from the channelling of high frequency electric fields through the record sheet material by the light produced conductivity patterns in the photoconductive plate. Positives or negatives of light patterns may be produced by controlling light pattern intensities.

3,752,668

ORGANIC PHOTOCONDUCTIVE MEMBERS COMPRISING DICYANOMETHYLENE SUBSTITUTED FLUORENE SENSITIZERS

Evan S. Baltazzi, Brookfield, Ill., assignor to Addressograph-Multigraph Corporation, Mount Prospect, Ill.

No Drawing. Continuation-in-part of abandoned application Ser. No. 679,246, Oct. 30, 1967. This application June 5, 1969, Ser. No. 830,879

Int. Cl. G03g 5/06, 13/22

U.S. Cl. 96—1.5 15 Claims

Organic photoconductive systems which employ organic polymers containing aromatic or heterocyclic nuclei are combined with amounts of π acid type additives for the purpose of extending the spectral response to the visible portion of the spectrum. The sensitizing compounds are dicyanomethylene substituted fluorenes which are added in an amount expressed in moles of sensitizer per 100 moles of the organic photoconductor calculated as the monomer. The amount of sensitizer to be added may range from 0.1 to about 100 moles per 100 moles of organic photoconductor based on the molecular weight of the monomer.

3,752,669

METHOD OF PRODUCING POSITIVE IMAGES FROM EPOXY COMPOSITIONS AND COMPOSITIONS THEREFOR

Oscar Robert Abolafia, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

No Drawing. Filed Dec. 17, 1971, Ser. No. 209,356

Int. Cl. G03c 1/72, 5/00

U.S. Cl. 96—36.2 11 Claims

An epoxy composition suitable for use as a positive photoresist and permanent dielectric is disclosed which includes an epoxy resin, a tertiary amine curing agent, and a halogenated hydrocarbon sensitizer. Also disclosed is a method of producing positive images from said composition which includes exposing the coated epoxy to actinic radiation, curing the coating to a critical point at which the exposed areas remain soluble in a solvent developer while the unexposed areas are substantially insoluble, and subsequently developing out the exposed area in the solvent developer. The use of this composition and method in printed circuit manufacturing is also described.

3,752,670

PHOTOGRAPHIC FILM ELEMENT AND METHOD FOR OBTAINING PHOTOGRAPHIC RECORDS OF WATER-SUBMERGED OBJECTS

Daniel George Needler and James Leo Graham, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Dec. 29, 1971, Ser. No. 213,813

Int. Cl. G03c 1/14, 7/00

U.S. Cl. 96—74 23 Claims

A color photographic element comprising a blue-sensitized silver halide emulsion layer having a maximum light absorption within about 480–500 nm. and having substantially no absorption above about 510 nm., containing a benzo- or naphtho-thia, oxa- or selenacarbocyanine salt as a blue spectral sensitizer dye, an inner green-sensitized emulsion layer responsive to light within about 525–590 nm. and an intermediate filter layer that filters light in the range of about 400–520 nm.; and also a method for improving photographic recordal of objects submerged in water by using such photographic elements.

3,752,671

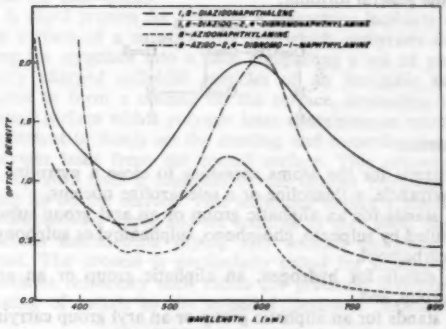
MATERIAL CONTAINING PHOTOSENSITIVE HALO AZIDO NAPHTHALENES

Balwant Singh, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Original application May 26, 1971, Ser. No. 147,117, now Patent No. 3,699,130. Divided and this application Aug. 2, 1972, Ser. No. 277,454

Int. Cl. G03c 1/52

U.S. Cl. 96—91 N 5 Claims



Novel halo azido naphthalenes and dry photoimaging processes and compositions employing said naphthalenes are disclosed.

3,752,672

METHOD OF INCORPORATING INGREDIENTS IN HYDROPHILIC COLLOIDS

Alfons Jozef De Pauw, Edegem, and Jan Albert Carpentier, Walem, Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium

No Drawing. Continuation of abandoned application Ser. No. 766,937, Oct. 11, 1968. This application July 8, 1971, Ser. No. 160,959

Claims priority, application Great Britain, Oct. 11, 1967, 46,459/67

Int. Cl. G03c 1/10

U.S. Cl. 96—100 21 Claims

A color-coupling or mask-forming component is incorporated into a hydrophilic colloid composition as a stable solution therein by means of a low boiling water immiscible organic solvent in which the component is dissolved and dispersed in the colloid composition or in a preparatory aqueous liquid subsequently admixed with the colloid composition, the organic solvent being then removed by evaporation whereby the component is contained in said colloid or the preparatory aqueous liquid in the form of a stable solution. The mask-forming or color-coupling component carries at least one sulfo or carboxyl group which is in salt form or is converted into salt form in situ by carrying out the dispersion step in the presence of an amount of alkali sufficient to neutralize such acid groups. A minor amount of a water-miscible organic solvent can also be provided to facilitate the dissolution of the component in the water immiscible solvent and both solvents can be removed by the evaporation. The colloid composition can be a light-sensitive silver halide emulsion directly or can be added after its preparation to a light-sensitive silver halide emulsion.

3,752,673

SILVER HALIDE EMULSION CONTAINING A MEROCYANINE DYE

Henri Depoorter, Mortsel, and Theofiel Hubert Ghys, Kontich, Belgium, assignors to Gevaert-AGFA N.V., Mortsel, Belgium

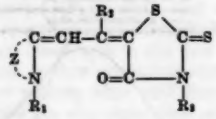
No Drawing. Filed Jan. 20, 1971, Ser. No. 108,162

Claims priority, application Great Britain, Jan. 20, 1970, 2,770/70

Int. Cl. G03c 1/22

U.S. Cl. 96—140 6 Claims

Novel merocyanine dyes are provided which correspond to the general formula:



wherein:

Z stands for the atoms necessary to close a pyrroline, a tetrazole, a thiazoline or a selenazoline nucleus,

R_1 stands for an aliphatic group or an aryl group substituted by sulphato, phosphono, sulphamoyl or sulphonylcarbamoyl,

R_2 stands for hydrogen, an aliphatic group or an aryl group, and

R_3 stands for an aliphatic group or an aryl group carrying at least one sulpho group or carboxyl group,

the acidic groups being in the free acid form or the salt form. These merocyanine dyes can be used for the spectral sensitization of light-sensitive silver halide emulsions. They do not enhance the fog and leave practically no residual stain after processing and therefore are particularly suitable for the sensitization of Lippmann-emulsions, emulsions of the "lith"-type and emulsions used in stabilisation processing.

3,752,674

SILVER HALIDE EMULSION FOGGED WITH A BORON HYDRIDE AND A GOLD COMPOUND

William Arthur Pritchett, Jr., Rochester, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed June 22, 1971, Ser. No. 155,629

Int. Cl. G03c 1/28

U.S. Cl. 96—108 12 Claims

Direct-positive photographic elements of high speed and maximum density are prepared by incorporating in the silver halide emulsion at least one boron hydride containing from 6 to 12 boron atoms in which the skeletal framework forms a polyhedron or a fragment thereof, and which may contain heteroskeletal atoms selected from the group consisting of carbon, sulfur and nitrogen, and a gold compound.

3,752,675

INCORPORATION OF NON-WHEAT GRAIN OR TUBER FLOURS OR STARCHES IN WHEAT FLOUR BASED BREAD, BAKED OR FRIED DOUGH GOODS

Cho C. Tsen and William J. Hoover, Manhattan, Kans., assignors to Kansas State University Research Foundation, Manhattan, Kans.

No Drawing. Filed Oct. 5, 1970, Ser. No. 78,238

Int. Cl. A21d 2/16, 13/04

U.S. Cl. 99—91 20 Claims

A method of permitting non-wheat grain or tuber flours or starches to be incorporated in wheat flour based bread, baked or fried goods doughs at levels which would deleteriously affect the quality of products prepared from the supplemented dough by introduction of 0.1% to 3% of an additive selected from the group of sodium salts of acyl lactylates of C_{14}–C_{22} fatty acids, and the condensation product of from 10–95 parts by weight of ethylene oxide and correspondingly from 90–5 parts by weight of a partial glycerol ester by a C_{10}–C_{24} fatty acid containing at least 10 weight percent monoglyceride content with diglycerides, triglycerides and glycerine the balance. The supplement may be added at levels as high as 40% wheat flour weight by use of 0.5% of the additive. A protein source material may also be added to supplement the protein content of a product prepared from the supplemented dough so long as the additive is present therein.

3,752,676

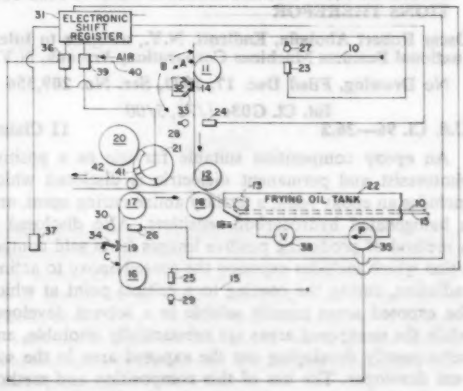
PHOTOSENSE DETECTING AND REMOVING STUCK CHIPS FROM A CARRIER OF A CHIP FRYING MACHINE

John E. Callaham, Columbia, Mo., assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 15, 1971, Ser. No. 198,621

Int. Cl. A23l 1/00

U.S. Cl. 99—100 P 6 Claims



A method of detecting and removing chips, e.g. potato chips, made from an edible dough after being fried in a hot oil bath in those few instances where the chips remain stuck to their individual carrier members and are not readily removable by conventional means. The method contemplates the provision of an electric photo sensor to detect a stuck chip through the blockage of openings in the carrier member and signalling an electronic shift register. One or more nozzles for discharging oil at high pressure are positioned over the path of travel of the carrier members beyond the electric photo sensor. A solenoid valve is operated by the shift register in timed sequence with the movement of the stuck chip in order to discharge oil from the nozzle against the stuck chip during passage beneath the nozzle. The struck chip is stripped from the carrier member in this fashion. A second electric photo sensor detects whether the stuck chip has been stripped off. If not, a signal is transmitted to the electronic shift register which then prevents deposit of a raw dough piece on any chip carrier in which either member of the pair has a stuck chip clinging thereto. This prevents the deposit and build up of stuck chips on any given carrier member until removed on successive cycles of the machine.

3,752,677

GREEN PEA SOUP MIX AND METHOD FOR MAKING THE SAME

Holt Andrews, Demarest, and Sirvart K. Bedrosian, Westwood, N.J., assignors to Thomas J. Lipton, Inc., Englewood Cliffs, N.J.

No Drawing. Filed Aug. 19, 1971, Ser. No. 173,322
Int. Cl. A23l *1/40*
U.S. Cl. 99—124 4 Claims

A dry green pea soup mix of improved flavor and color stability and reconstitutable in less than one minute by the addition of boiling water is disclosed. The preferred mix comprises an agglomerated blend of, by weight, about 72% green pea flakes, about 12% corn syrup solids, about 5.5% green pea powder, about 4.5% spice mix, about 3.0% smoked yeast, about 1.5% starch and about 0.5% each of sugar, monosodium glutamate, and vegetable protein.

The green pea flakes are formed by cooking green split peas in aqueous slurry and by addition of vegetable oil and starch. The slurry is dried and is broken into flakes which are blended with green pea powder, corn syrup solids, flavoring and the balance of the ingredients while maintaining the integrity of the flakes. The blend is then agglomerated, dried and sized through a screen.

3,752,678

GEL-COATED FROZEN CONFECTION

Timothy John Jenkinson, St. Albans, and Tegwyn Pierce Williams, Great Doddington, near Wellingborough, England, assignors to Lever Brothers Company, New York, N.Y.

No Drawing. Filed Apr. 8, 1971, Ser. No. 132,546
Claims priority, application Great Britain, Apr. 20, 1970, 18,807/70
Int. Cl. A23g *5/00*; A23l *1/04*
U.S. Cl. 99—136 7 Claims

A frozen foodstuff, particularly ice cream, is coated with an aqueous thixotropic gel based on a water soluble polysaccharide. The thixotropic gel may be an aliginate gel containing alkali metal ions and calcium or aluminium ions, or may be a gel based on Xanthan gum.

3,752,679

REFRACTORY LAMINATE BASED ON NEGATIVE SOLS OR SILICATES AND POLYMERIC LATTICES CONTAINING CATIONIC SURFACTANTS

Earl P. Moore, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of abandoned application Ser. No. 49,913, June 25, 1970. This application June 1, 1971, Ser. No. 148,963
Int. Cl. C04b *35/14*
U.S. Cl. 106—38.35 11 Claims

A rapid process for forming a refractory laminate on the surface of a support structure which comprises dipping the structure in a bath comprising a sol of negatively charged colloidal particles of an inorganic substance and/or a solution of an alkaline ionic silicate to form a coating on the surface, contacting the coated surface with a setting agent, an organic polymeric latex containing a cationic surfactant to firmly set the colloidal silica or silicate. This procedure is repeated until a laminate of the desired thickness is built up on the surface. In order to increase the rate of laminate build-up particulate refractory material can be included in the bath and/or the coated surface can be stuccoed between dips. Interaction between the negatively charged colloidal particles or silicate and the cationic surfactant setting agent results in destabilization of the latex, polymerization of the silica or silicate and aggregation of silica-polymer particles and thereby the immobilization of the coatings. This technique makes it possible to successively apply and set coatings to build refractory laminates in very short times without intermediate drying and without sloughing of coats. The process is particularly suited for making expendable, refractory shell molds for precision investment casting of metals by the so-called "lost-wax" technique.

3,752,680

REFRACTORY LAMINATE BASED ON POSITIVE SOLS AND POLYMER LATTICES CONTAINING ANIONIC SURFACTANTS

Earl P. Moore, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of abandoned application Ser. No. 49,912, June 25, 1970. This application June 1, 1971, Ser. No. 148,962
Int. Cl. C04b *35/14*
U.S. Cl. 106—38.35 10 Claims

A rapid process for forming a refractory laminate on the surface of a support structure which comprises dipping the structure into a bath comprising a sol of positively charged colloidal particles of an inorganic substance to form a coating on the surface, contacting the coated surface with a polymer latex containing an anionic surfactant to firmly set the coating, and removing excess polymer latex from the coated surface. This procedure is repeated until a laminate of the desired thickness is built up on the surface. This technique makes it possible to successively apply and set coatings in very short times without intermediate drying and without sloughing of coats. The process is particularly suited for making expendable refractory shell molds for precision investment casting of metals by the so-called "lost-wax" technique.

3,752,681

REFRACTORY LAMINATE BASED ON POSITIVE SOLS AND MONOFUNCTIONAL ORGANIC ACIDS AND SALTS

Earl P. Moore, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of abandoned application Ser. No. 49,914, June 25, 1970. This application June 1, 1971, Ser. No. 148,957
Int. Cl. C04b *35/14*
U.S. Cl. 106—38.35 13 Claims

A rapid process for forming a refractory laminate on the surface of a support structure which comprises dipping the structure into a bath comprising a sol of positively charged colloidal particles to form a coating on the surface, contacting the coated surface with a solution or dispersion of a monofunctional organic acid or salt to firmly set the coating, and removing excess setting agent solution or dispersion from the coated surface. This procedure is repeated until a laminate of the desired thickness is built up on the surface. This technique makes it possible to successively apply and set coatings in very short times without intermediate drying and without sloughing of coats. The process is particularly suited for making expendable refractory shell molds for precision investment casting of metals by the so-called "lost-wax" technique.

3,752,682

ZIRCON-PYROPHYLLITE UNFIRED REFRACTORY BRICKS AND METHOD FOR THE MANUFACTURE OF THE SAME

Naoyuki Namoishi, Takasago, and Hajime Yoshino and Shigetoshi Uto, Kakogawa, Japan, assignors to Harima Refractories Co., Ltd., Hyogo-ken, Japan

Filed July 27, 1971, Ser. No. 166,447
Claims priority, application Japan, Sept. 2, 1970, 45/76,324
Int. Cl. C04b *35/16*
U.S. Cl. 106—57 14 Claims

Disclosed herein is an unfired refractory brick consisting essentially of zircon and pyrophyllite with sodium silicate added as a binder, wherein the grain sizes of said zircon and said pyrophyllite are defined in a predetermined range.

3,752,683
PROTECTION OF TURBINE CASINGS
Peter Frederick Hawthorne, Nechells, Birmingham, England, assignor to Foseco International Limited, Birmingham, England
No Drawing. Filed Oct. 1, 1970, Ser. No. 77,348
Claims priority, application Great Britain, Oct. 6, 1969, 49,044/69; July 2, 1970, 32,217/70
Int. Cl. C04b *35/66*
U.S. Cl. 106—55 9 Claims

Shaped refractory articles, especially turbine casing liners, are formed of a refractory fibre/water soluble binder composition, the hardness, strength and density of which do not vary across the bulk composition.

3,752,684
INSULATING REFRACTORY AND A METHOD FOR MANUFACTURING SAME
Jean-Pierre Kiehl, Lyon, and Victor Jost, Bron, France, assignors to Societe Generale des Produits Refractaires Paris, France
No Drawing. Filed June 14, 1971, Ser. No. 153,099
Claims priority, application France, July 9, 1970, 70/25,437
Int. Cl. C04b *35/04*
U.S. Cl. 106—58 3 Claims

A semirigid insulating product and method of making same having a use-limit temperature of at least 1200° C. and a density less than 0.9 gm./cc. The product is made from a batch comprising, by weight:

Neutral magnesium phosphate—12 to 25%
Alkaline-earth oxides in excess—up to 5%
Silica—50 to 80%
Other acid oxides—up to 20%, and
Mineral fibers—2 to 20%.

3,752,685
METHOD FOR PRODUCING HOLLOW GLASS MICRO-SPHERES AND THEIR COMPOSITES
Hidemasa Honda, Yukio Isayama, Kazuhiko Jinnai, and Kunio Kimura, Tosu, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan
Filed Mar. 2, 1971, Ser. No. 120,253
Claims priority, application Japan, Mar. 6, 1970, 45/18,722
Int. Cl. C08h *17/02*; C09c; C09d
U.S. Cl. 106—288 B 8 Claims

When finely divided Shirasu (pumice ejected from volcanoes and the secondary deposit of such pumice) is roasted at a temperature in the range of from about 800° C., to about 1200° C., the vitreous particles contained in said Shirasu foam and consequently produce light-weight hollow glass micro-spheres. The hollow glass micro-spheres so produced are superior to conventional glass micro-spheres especially in their resistance to heat and can therefore be combined with metal, carbon, as well as with cement and other materials to produce novel light-weight composites.

3,752,686
PROCESS FOR THE CONVERSION OF PERYLENE-3,4,9,10 - TETRACARBOXYLIC ACID DIIMIDE INTO A FORM SUITABLE AS PIGMENT DYESTUFF
Dietmar Kalz, Cologne, Karlheinz Wolf, Leverkusen, Gerhard Wolfrum, Bergisch-Neukirchen, and Reinhold Hornle, Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed Dec. 23, 1971, Ser. No. 211,681
Claims priority, application Germany, Dec. 24, 1970, P 20 63 714.3
Int. Cl. C08h *17/14*
U.S. Cl. 106—288 Q 3 Claims

Perylene - 3,4,9,10-tetracarboxylic acid diimide is obtained in a brilliant, deeply coloured, light- and weather-fast pigment form by salt grinding in the presence of 1–30% of higher aliphatic amines.

3,752,687
TITANIUM DIOXIDE MIXING
Granville J. Hahn, Big Spring, Tex., assignor to Cosden Oil & Chemical Company, Big Spring, Tex.
Continuation-in-part of application Ser. No. 525,949, Feb. 8, 1966. This application Nov. 10, 1969, Ser. No. 875,184
Int. Cl. C09c *1/36*
U.S. Cl. 106—300 2 Claims

Discoloration of white titanium dioxide during mixing, milling or blending by abrasive discoloration by metallic parts of the mixer are prevented by coating or plating the mixing bowl and mixing elements with very hard material exceeding about eight mohs such as tungsten carbide or other hard carbide materials.

3,752,688
PROCESS FOR WET GRINDING OF PIGMENTS IN AQUEOUS ALKALINE MEDIUM
Otto Fuchs, Frankfurt am Main, Reinhold Deubel, Altenhain, Taunus, and Joachim Weide, Kelkheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany
No Drawing. Filed Sept. 2, 1971, Ser. No. 177,517
Claims priority, application Germany, Sept. 4, 1970, P 30 43 820.4
Int. Cl. C08h *17/14*
U.S. Cl. 106—309 5 Claims

A process for the wet grinding of pigments which comprises effecting the grinding in an aqueous medium containing 0.1–20 percent of a base selected from the group of water soluble alkali metal-, alkali earth metal- or ammonium compounds. The addition of bases improves the transmission of grinding energy to the material being ground and results in the production of purer pigments of better tinctorial strength in a relatively short grinding time. Furthermore, the grinding process according to the invention is carried out in a simple and inexpensive way.

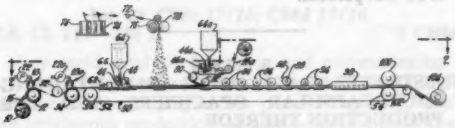
3,752,689
REFRACTORY LAMINATE BASED ON POSITIVE SOLS AND ORGANIC OR INORGANIC BASES
Earl P. Moore, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Continuation-in-part of abandoned application Ser. No. 49,906, June 25, 1970. This application June 1, 1971, Ser. No. 148,960
Int. Cl. C04b *35/14*
U.S. Cl. 106—38.3 12 Claims

A rapid process for forming a refractory laminate on the surface of a support structure which comprises dipping the structure into a bath comprising a sol of positively charged colloidal particles of an inorganic substance to form a coating on the surface, contacting the coated surface with a solution or dispersion of an organic or inorganic base to firmly set the coating, and removing excess setting agent solution or dispersion from the coated surface. This procedure is repeated until a laminate of the desired thickness is built up on the surface. This technique makes it possible to successively apply and set coatings in very short times without intermediate drying and without sloughing of coats. The process is particularly suited for making expendable refractory shell molds for precision investment casting of metals by the so-called "lost-wax" technique.

3,752,690
METHOD OF MAKING INLAID RESINS AND ARTICLE PRODUCED THEREBY
Everett R. Miller, Dennisport, Mass., assignor to Owens-Corning Fiberglas Corporation
Filed May 24, 1971, Ser. No. 146,266
Int. Cl. B44c *1/20*
U.S. Cl. 117—8 7 Claims

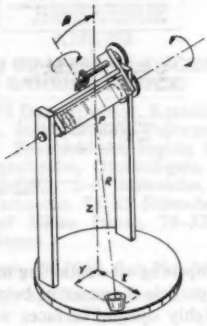
A bottom carrier sheet of material having memory is passed over a roll having depressions therein, and a curable resin under pressure forces the sheet into the depres-

sion and fills the depressions in the sheet material. Excess resin is scraped from the sheet leaving the resin which fills the depressions in place. The sheet is then removed from the roll and caused to assume a flat condition to move the resin up out of the depressions and provide raised indicia of the configuration of the depressions.



Indicia of different colors can be added in like manner, and finally a film of resin is flowed around and over the raised indica. The film of resin is covered by a top sheet of separation material and the composite sandwich of resin and top and bottom separation sheets are rolled into a package and cured to produce a sheet molding compound.

3,752,691
METHOD OF VACUUM EVAPORATION
William S. Little, Jr., Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed June 29, 1971, Ser. No. 157,911
Int. Cl. C23c *13/02, 13/04*
U.S. Cl. 117—38 **4 Claims**



A method of vapor depositing a uniform layer of material on the surface of cylindrical substrate which comprises rotating said substrate simultaneously about its perpendicular axis and longitudinal axis while maintaining the substrate at a plane inclined to the horizontal, with a small surface source of evaporant located below said rotating substrate, with the ratio of the radius of the substrate to the source-to-substrate distance being maintained from about 0 to 1.0, said evaporant source emitting a vapor flux which deposits as a substantially uniform layer upon the surface of said substrate by maintaining a slotted mask between the substrate and evaporant source, while maintaining said substrate and evaporant source under vacuum conditions during the entire evaporation cycle.

3,752,692
DIFFUSION TRANSFER IMAGE RECEIVING ELEMENT
Richard W. Young, Wellesley Hills, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
No Drawing. Filed Mar. 29, 1971, Ser. No. 129,276
Int. Cl. B05c *9/04*
U.S. Cl. 117—68 **21 Claims**

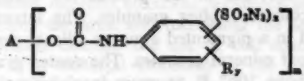
This invention relates to photographic elements for use in diffusion transfer processes performed outside of the camera wherein exposure of said photographic elements was affected, and particularly relates to an image-receiving element which is opaque to avoid exposure of the photosensitive element after removal from the camera and which is further adapted to prevent distortion or curling of the image-receiving element subsequent to separation from the photosensitive element.

3,752,693
PROCESS FOR TREATING METALLIC BASE MATERIAL
Masao Suetsugi, Tokyo, Tadasu Kimura, Juichi Kobayashi, and Koji Matsushima, Hiroshima, and Hideo Nakamoto, Yamaguchi, Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan
No Drawing. Filed May 12, 1971, Ser. No. 142,745
Claims priority, application Japan, May 15, 1970, 45/41,160
Int. Cl. B32b *15/08*
U.S. Cl. 117—75 **8 Claims**

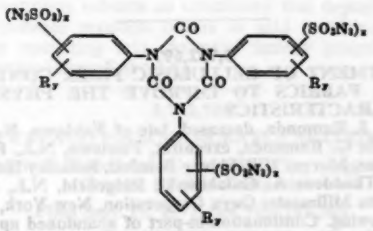
A metallic base material is treated to improve corrosion resistance, adhesion between the base material and film coated thereon, and post processability of said coating by applying a coating material contaning 1 to 85% of free isocyanate groups and then if desired further applying a resin-containing coating material.

3,752,694
PROCESS FOR BONDING POLYURETHANE TO SUBSTRATE
Adnan A. R. Sayigh and Fred A. Stuber, North Haven, and Henri Ulrich, North Branford, Conn., assignors to The Upjohn Company, Kalamazoo, Mich.
No Drawing. Original application Mar. 2, 1970, Ser. No. 15,948, now Patent No. 3,652,504. Divided and this application Dec. 2, 1971, Ser. No. 204,361
Int. Cl. B44d *1/50*
U.S. Cl. 117—93.31 **4 Claims**

Polyurethane coatings are chemically bonded to substrates, including polyolefins and like substrates with which polyurethanes will not normally react, by incorporating, into the polyurethane coating composition used to prepare the coating, from 0.1 percent to 10 percent by weight, based on polyurethane, of a sulfonylazide of formulae:



and



wherein A is the residue of an aliphatic alcohol having *m* hydroxyl groups and a molecular weight less than 300, R is lower-alkoxy or halo, *x* is 1 to 2, *y* is 0 to 2, and $x+y$ is ≥ 3, the SO_2N_3 groups are in 3, 4, or 5-positions in the phenyl rings, provided that one such position is always unsubstituted and *m* is 1 to 6. The chemical bonding can be carried out by irradiation imagewise thereby making the compositions useful in photoresist systems.

3,752,695

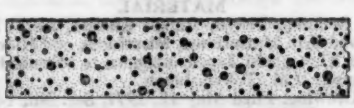
COATED POLYURETHANE FOAM HAVING AN INTEGRAL SKIN

Anthony F. Finelli, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of abandoned application Ser. No. 650,800, July 3, 1967. This application Sept. 23, 1970, Ser. No. 74,855

Int. Cl. B32b *5/18, 27/40*

U.S. Cl. 117—98 5 Claims



This invention relates to a molded polyurethane foam article which has an integral skin having the desired aesthetic and decorative effect such as simulated sewn seams. Polyurethane molded foam articles of this nature are obtained by pouring a foamable polyurethane reaction mixture into contact with a mold such as a silicone rubber, letting the foam react and cure. Since the foam will tend to discolor it is preferred to coat the skin with a coating, usually a spray coat of 2 to 6 mils of a polyurethane of a nondiscoloring type to obtain an article which is suitable for use as an interior decorative element in an automobile, for instance.

3,752,696

COLORED ROOFING GRANULES

Romayne M. Beyard and John C. Horai, Hagerstown, Md., assignors to GAF Corporation, New York, N.Y.

No Drawing. Filed Feb. 17, 1967, Ser. No. 616,795

Int. Cl. B44d *1/20*

U.S. Cl. 117—100 D 9 Claims

Barium fluosilicate and other metal fluosilicate encapsulated by a polymeric composition such as polyvinyl chloride, that is substantially insoluble in water and alkali silicate at a temperature below about 100° F., but is capable of dissolving in hot alkali silicate binder, is used as a latent reactant in the process for manufacturing artificially colored roofing granules. The latent reactant is suspended in a pigmented aqueous silicate slurry which is used to coat mineral granules. The coated granules are heated to above 200° F. to cause insolubilization of the silicate by the chemical action of the fluosilicate.

3,752,697

TREATMENT OF CELLULOSIC FIBER CONTAINING FABRICS TO IMPROVE THE PHYSICAL CHARACTERISTICS

Angelo J. Ramunda, deceased, late of Fairlawn, N.J., by Phyllis G. Ramunda, executrix, Fairlawn, N.J., Phillip Adams, Murray Hill, Sidney Beinfest, Berkeley Heights, and Thaddeus A. Gulakowski, Ridgefield, N.J., assignors to Millmaster Onyx Corporation, New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 789,916, Jan. 8, 1969. This application May 19, 1971, Ser. No. 145,042

Int. Cl. D06m *13/12*

U.S. Cl. 117—138.8 F 5 Claims

A treatment for cellulosic fabrics and fabrics constructed of blends of cellulosic and non-cellulosic synthetic fibers, whereby the durability of the fabrics is retained even after repeated launderings while the "hand" of the fabrics is much improved over that obtained by prior treatments. This treatment consists of the application to the fabrics of a composition containing, as the active ingredient, a mixture of methylolated methyl carbamate with either (a) methylolated methoxyethyl carbamate, or (b) methylolated hydroxyethyl carbamate, or (c) methylolated n-propyl carbamate wherein the percentage of the methylolated methyl carbamate is about from 10 to 70 mol percent and of the other component is between about 90 to 30 mol percent.

3,752,698

SUBSTRATES COATED WITH AIR-CONTAINING MICROCAPSULAR OPACIFIERS AND THE PRODUCTION THEREOF

Anthony E. Vassiliades, Deerfield, Edward F. Nauman, Lake Forest, and Shrenik Shroff, Chicago, Ill., assignors to Champion International Corporation, New York, N.Y.

Original application Dec. 23, 1968, Ser. No. 786,337. Divided and this application Mar. 16, 1971, Ser. No. 124,984

Int. Cl. B44d *1/24;* B32b *29/00;* D21h *1/34*

U.S. Cl. 117—138.8 E 30 Claims

PREPARE A SOLUTION OF A HYDROPHOBIC, THERMOPLASTIC RESIN IN A WATER-AND OIL-MISCIBLE ORGANIC SOLVENT
EMULSIFY A WATER-IMMISCIBLE OILY MATERIAL IN AN AQUEOUS COLLOIDAL SOLUTION OF AN AMPHOPHILIC EMULSIFYING AGENT
SLOWLY ADMIX THE RESIN SOLUTION AND THE EMULSION UNDER CONDITIONS OF BRISK AGITATION TO SEPARATE THE RESIN FROM SOLUTION AND ENCAPSULATE MINUTE LIQUID EMULSION DROPLETS
ADD ADDITIONAL EMULSIFYING AGENT TO THE MICROCAPSULAR DISPERSION TO EMULSIFY RESIDUAL ORGANIC SOLVENT AND TO AID IN BINDING
COAT THE MICROCAPSULAR DISPERSION ONTO A WEB MATERIAL AND DRY
PRINCIPAL STEPS
OPTIONAL STEPS

Opacifiers comprising air-containing microcapsules having an average particle diameter of below about one micron provide highly opaque surfaces when coated onto and/or incorporated into fibrous and non-fibrous substrates. The opacifiers are produced by heating liquid-containing precursor microcapsules at temperatures sufficient to expel the liquid and provide air in the microcapsule.

3,752,699

HYDROXYLATED ALPHA-OLEFIN/NON-CONJUGATED DIENE POLYMER

Jerald R. Harrell, Anestis L. Logothetis, and John J. Verbanc, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Application July 9, 1969, Ser. No. 840,511, now Patent No. 3,679,627, which is a continuation-in-part of abandoned application Ser. No. 764,328, Oct. 1, 1968. Divided and this application May 30, 1972, Ser. No. 257,669

Int. Cl. D08m *3/02*

U.S. Cl. 117—141 2 Claims

An hydroxylated alpha-olefin/non-conjugated diene polymer having hydroxylated side chains in admixture with clay, ZnO, $ZnBr_2$, a phenol-formaldehyde resin or polyisocyanate. An hydroxylated alpha-olefin/non-conjugated diene polymer having hydroxyl substituted side chains containing one hydroxyl group each and other side chains containing ethylenic unsaturation and a process for making.

3,752,700

METHOD OF IMPREGNATING PAPER

Rolf Dahl, West Columbia, S.C., assignor to Continental Tapes, Incorporated, Columbia, S.C.

No Drawing. Original application June 29, 1970, Ser. No. 50,953. Divided and this application Mar. 22, 1972, Ser. No. 236,958

Int. Cl. C08c *17/16;* C08d *13/16*
U.S. Cl. 117—155 R 3 Claims

Very rapid catalytic formation and polymerization of polyurethane polymers followed by cross-linking with complex, hindered polyamines permits one step, in-situ and continuous production of new types of pressure-sensitive adhesives and impregnated permeable materials.

3,752,701

GLASS FOR COATING SEMICONDUCTORS, AND SEMICONDUCTOR COATED THEREWITH

William J. Morrissey, Chelmsford, Mass., assignor to General Instrument Corporation, Newark, N.J.

No Drawing. Filed July 27, 1970, Ser. No. 58,710

Int. Cl. C03c *3/04, 3/08*
U.S. Cl. 117—201 8 Claims

An alkali-free zinc-borosilicate glass containing small amounts of lead and aluminum oxide constitutes an excellent passivating and protecting coating for semiconductors.

3,752,702

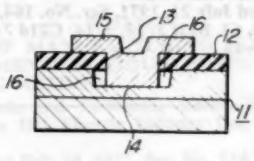
METHOD OF MAKING A SCHOTTKY BARRIER DEVICE

Mutsuo Iizuka, 801 Oaza Hoshida, Katanocho, Kitakawachi-gun, Osaka, Japan; Shohei Fujiwara, 6–23 Himurocho-1-chome, Takatsuki-shi, Japan; Gota Kano, 38 Uguisudai, Nagaokacho, Otokuni-gun, Kyoto, Japan; Hiromasa Hasegawa, 2–8 Saiwaicho, Takatsuki-shi, Japan; Iwao Teramoto, 78–83 Shimohozumi, Ibaragishi, Japan; and Hitoo Iwasa, 76–32 Okamotocho, Takatsuki-shi, Japan

Filed Sept. 29, 1969, Ser. No. 861,670

Claims priority, application Japan, Oct. 4, 1968, 43/72,668

Int. Cl. B28d *5/00;* H01l *7/50*
U.S. Cl. 117—217 4 Claims



An etching process for <111> oriented silicon substrate along a hexagonal window, in which an etched recess is formed along the window in a clear shape by means of directing one side of the hexagonal window parallel to a crystallographic axis <$\bar{1}$10> or <1$\bar{1}$0>. A metal is then formed in the etched recess to form the Schottky barrier between the metal and the semiconductor material by depositing said metal by means of the sputtering or vacuum evaporation method. A vacant space is thereby formed just under an insulating film along the periphery of the window, resulting in a Schottky barrier device having a good backward characteristic.

3,752,703

PROPELLANT MIXTURE COMPRISING DIFLUOROBROMINIUM TETRAFLUOROBORATE OXIDIZER COMPONENT

Madeline S. Toy, Fountain Valley, and William A. Cannon, Costa Mesa, Calif., assignors to the United States of America as represented by the Secretary of the Army

No Drawing. Original application July 19, 1968, Ser. No. 745,984, now Patent No. 3,645,702. Divided and this application Nov. 13, 1970, Ser. No. 89,520

Int. Cl. C06d *5/06*
U.S. Cl. 149—19 1 Claim

Propellant mixture comprising difluorobrominium tetrafluoroborate oxidizer in combination with binder and fuel components.

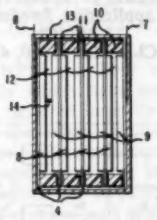
3,752,704

SELF-SEALING BATTERY WITH NONAQUEOUS ELECTROLYTE

Hanspeter Alder, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of abandoned application Ser. No. 80,050, Oct. 12, 1970. This application Nov. 22, 1971, Ser. No. 200,728

Int. Cl. H01m *35/04*
U.S. Cl. 136—6 B 13 Claims



A galvanic battery comprising a plurality of series connected galvanic cells each of which contains a liquid, nonaqeuous electrolyte in contact with the electrolyte of the other cells has increased wet-stand life resulting from increased intercell electrical resistance obtained by: (1) restricting the area and increasing the length of intercell channels through the use of cell spacing gaskets composed of a material swellable in the electrolyte to the extent of from 1% to 10% linearly and (2) further restricting the intercell channels by employing electrolytes and electrolyte solvents so constituted that deposition of cell discharge products occurs in said restricted area, further restricting said channels, thereby progressively eliminating intercell shorting.

3,752,705

HIGH CAPACITY RECHARGEABLE SEALED CELL

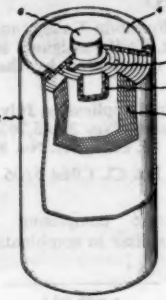
Saverio F. Pensabene, Gainesville, Fla., assignor to General Electric Company

Filed Sept. 17, 1971, Ser. No. 181,305

Int. Cl. H01m *35/16*
U.S. Cl. 136—13 6 Claims

A high capacity, rechargeable sealed cell is constructed using plate materials normally used in the construction of low capacity, high discharge rate materials. The cell is constructed by winding a strip of one of the electrodes onto itself, winding a layer of separator materials over this core, and winding a layer of the other electrode onto itself over the separator material. By eliminating the layers of separator between adjacent materials—except

for the single layer of separator between the two plates—additional space is provided in the same volume so that

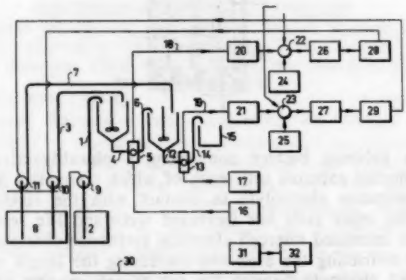


additional active electrode material may be incorporated into the cell.

3,752,706
METHOD FOR PRODUCING AN ELECTROCHEMICALLY ACTIVE MATERIAL FOR NICKEL HYDROXIDE ELECTRODES

Ake Lennart Melin, Oskarshamn, Sweden, assignor to Svenska Ackumulator Aktiebolaget Jungner, Oskarshamn, Sweden

Filed Jan. 15, 1970, Ser. No. 3,149
Claims priority, application Sweden, Jan. 31, 1969, 1,368/69
Int. Cl. H01m *43/00, 43/04*
U.S. Cl. 136—24 **1 Claim**



Method and apparatus for producing electrochemically active metal hydroxides for nickel hydroxide electrodes for alkaline accumulators by precipitation of the hydroxides from a solution of metallic salts with the aid of an alkaline metal hydroxide solution, according to which the precipitation, in order to obtain a uniform crystallinity throughout the material, takes place continuously in at least one step by allowing the salt solution and the metal hydroxide solution to run down simultaneously into a reaction vessel, keeping pH value, temperature and concentration in each step constant.

3,752,707
CORROSION RESISTANT COMPOSITION AND METHOD

Isaac Laird Newell, Wethersfield, Conn., and William F. Houlihan, Springfield, Mass., assignors to Heatbath Corporation, Springfield, Mass.

No Drawing. Filed Aug. 23, 1971, Ser. No. 174,150
Int. Cl. C23f *7/26*
U.S. Cl. 148—6.2 **22 Claims**

Corrosion resistant compositions are disclosed which comprise an aqueous solution of a water-soluble hexavalent chromium compound, a water-soluble inorganic fluorine-containing compound and a soluble rare earth metal salt. The method of imparting a protective film to a metal surface using these compositions is also described.

3,752,708
CORROSION RESISTANT COMPOSITION AND METHOD

Isaac Laird Newell, Weathersfield, Conn., and William F. Houlihan, Springfield, Mass., assignors to Heatbath Corporation, Springfield, Mass.

No Drawing. Filed Aug. 23, 1971, Ser. No. 174,151
Int. Cl. C23f *7/26*
U.S. Cl. 148—6.2 **23 Claims**

Corrosion resistant compositions are disclosed which comprise an aqueous solution of a water-soluble hexavalent chromium compound, a water-soluble inorganic fluorine-containing compound, a soluble rate earth metal and a water-soluble manganese salt. The method of imparting a protective film to a metal surface using these compositions is also described.

3,752,709
CORROSION RESISTANT METASTABLE AUSTENITIC STEEL

Victor F. Zackay, Berkeley, and Earl R. Parker, Oakland, Calif., assignors to the United States of America as represented by the United States Atomic Energy Commission

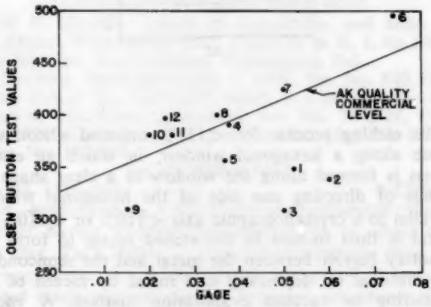
No Drawing. Filed Oct. 12, 1970, Ser. No. 80,193
Int. Cl. C21d *7/14*
U.S. Cl. 148—12 **9 Claims**

A steel and a process for imparting to such steel a combination of high strength, high uniform elongation, high toughness and corrosion resistance. The process consists of subjecting single phase, austenitic steel which has an M_S below ambient temperature, a total carbon plus nitrogen content of from about 0.15% to about 0.5%, a chromium content of from about 11% to about 18%, and at least 0.5% of at least one alloying element selected from the group consisting of molybdenum, manganese, vanadium, niobium, tantalum and tungsten preferably molybdenum, to deformation at a temperature above about 400° F. but below the recrystallization temperature of the steel.

3,752,710
METHODS OF FINISHING RECONSTITUTED METAL

Mark E. Whalen, Pepper Pike, and Joseph W. Malleck, Chagrin Falls, Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Filed July 21, 1971, Ser. No. 164,649
Int. Cl. B22f *3/12, 3/14;* C21d *7/14*
U.S. Cl. 148—12 **28 Claims**



Methods are disclosed for rolling reconstituted metal, i.e., metal obtained by solid state compaction of pieces of

steel, into sheet or strip products which possess excellent formability characteristics. Hot rolled products are produced by a preferred method including the steps of rolling reconstituted metal at a finishing temperature from about 1400° F. to 1500° F. to a final thickness which is no greater than 20% of the original thickness, hot coiling the rolled product while at a temperature of at least 1200° F., preferably at least 1270° F. and allowing the coiled metal to cool and self-anneal in air. The preferred method of making hot rolled products from reconstituted metal may include a novel pickling operation wherein the annealed, rolled metal is heated prior to being immersed in a hot acid bath. Deep draw quality, cold rolled products are made by cold rolling reconstituted metal to reduce its thickness by an amount less than 50% and then annealing the rolled metal.

3,752,711

METHOD OF MANUFACTURING AN IGFET AND THE PRODUCT THEREOF

Else Kooi, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 1, 1971, Ser. No. 148,416

Claims priority, application Netherlands, June 4, 1970, 7008101

Int. Cl. H01l *7/40, 11/00*

U.S. Cl. 148—33.3 **7 Claims**

The invention relates to a method of manufacturing an insulated gate field effect transistor in which an inset silicon oxide layer is provided on the surface of a silicon body by means of a masking layer which masks against oxidation.

3,752,712

IRON-COPPER PREALLOYS

Robert T. Holcomb, Westmount, Quebec, Canada, assignor to Domtar Limited, Montreal, Quebec, Canada

No Drawing. Filed June 7, 1971, Ser. No. 150,787

Int. Cl. C21d *1/00*

U.S. Cl. 148—126 **6 Claims**

A prealloyed iron-copper powder which has high compressibility and shrinks upon sintering is prepared by melting a charge of iron and copper, atomizing the charge with water jets under pressure, further comminuting the particles if desired, and subjecting the formed powder to a heat treatment between 1400° F. and 1800° F. in a reducing atmosphere followed by a controlled cooling.

3,752,713

METHOD OF MANUFACTURING SEMICONDUCTOR ELEMENTS BY LIQUID PHASE EPITAXIAL GROWING METHOD

Masaaki Sakuta and Toshimasa Ishida, Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Feb. 10, 1971, Ser. No. 114,174

Claims priority, application Japan, Feb. 14, 1970, 45/12,276, 45/12,277

Int. Cl. H01l *7/38*

U.S. Cl. 148—171 **9 Claims**

A semiconductor element of multi-layer construction with P-N junctions between layers is prepared by contacting a semiconductor substrate with a solution containing at least three elements of groups III and V and doped with a P-type impurity and a N-type impurity, contacting a semiconductor substrate with the solution, heating the semiconductor substrate and the solution to a predetermined temperature and repeating alternately a relatively slow cooling and a relatively fast cooling to grow layers of semiconductor crystals of the III–V compounds.

3,752,714

METHOD FOR SELECTIVE EPITAXIAL DEPOSITION OF INTERMETALLIC SEMICONDUCTOR COMPOUNDS

Kazuhiro Ito, Hachioji, and Shinya Iida, Hino, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed July 31, 1970, Ser. No. 59,901

Claims priority, application Japan, Aug. 4, 1969, 44/61,008

Int. Cl. H01l *7/36, 7/50*

U.S. Cl. 148—175 **2 Claims**

A method of selective epitaxial deposition of intermetallic semiconductor compounds having a zinc blende type crystalline structure, such as gallium arsenide, in rectangular holes etched into {100} oriented substrates of same material as the deposited compound. The holes are oriented in the <100> to <310> directions, so as to obtain hole walls, which are substantially perpendicular with respect to the upper surface of substrate, and which result in the formation of flat upper surfaces of single crystals deposited in those holes. The holes are etched with a H_2SO_4:H_2O_2 (1:10 by volume) solution.

3,752,715

PRODUCTION OF HIGH SPEED COMPLEMENTARY TRANSISTORS

Igor Antipov, Pleasant Valley, and Avtar S. Oberai, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 15, 1971, Ser. No. 198,593

Int. Cl. H01l *7/44, 7/64*

U.S. Cl. 148—187 **6 Claims**

Complementary NPN and PNP transistors are prepared simultaneously which have properties of a high frequency response. Selected impurity concentrations are employed whereby the second emitter diffusion is performed with the first emitter area unmasked. This eliminates any emitter contact opening step such that each contact area and emitter are co-extensive. Other circuit components such as resistors and diodes are also formed during the formation of the NPN and PNP transistors.

ERRATUM

For Class 149—19 see:
Patent No. 3,752,703

3,752,716

PROCESS FOR THE PRODUCTION OF PRESSURE-SENSITIVE ADHESIVES

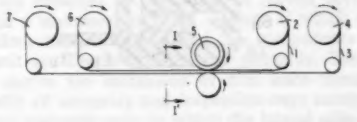
Yasuhiro Moriyama and Takafumi Okamoto, Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Filed May 10, 1971, Ser. No. 141,562

Claims priority, application Japan, May 9, 1970, 45/39,479

Int. Cl. B32b *31/20;* B44d *1/092, 1/44*

U.S. Cl. 156—3 **19 Claims**



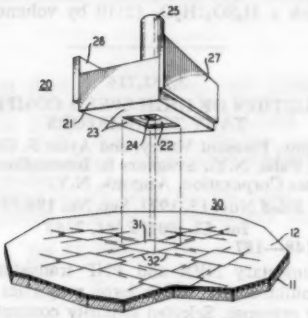
A process for the production of a pressure-sensitive adhesive having a fluorocarbon resin film as the support,

which comprises treating at least one surface of a fluorocarbon resin film to provide adhesivity to the surface, applying a pressure-sensitive adhesive material to the surface of the film thus treated, superposing a fluorocarbon resin film on the adhesive layer thus formed, and compression rolling the laminate using rolls heated to temperatures of higher than 25° C. and lower than the melting point of the fluorocarbon resin is disclosed.

3,752,717
MOUNTING MEDIA FOR SEMICONDUCTOR FABRICATION

Malcolm Lunt White, Bethlehem, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 5, 1971, Ser. No. 169,305
Int. Cl. H01l 7/50; B32b 33/00
U.S. Cl. 156—17 **12 Claims**

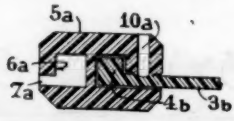


Two hydrocarobn compounds, fluorene and docosane, are especially useful as temporary mounting media during various stages of processing semiconductor devices, and, in particular, for processing silicon integrated circuit chips. These compounds have an advantage over waxes in that they leave no contaminating residues upon vaporization when exposed to a source of heat, such as a thermode pickup device.

3,752,718
PROCESS FOR THE MANUFACTURE OF A SLIDE FASTENER

Marcel Potin, Choisy-le-Roi, France, assignor to Societe Financiere Francaise de Licences et Brevets, Choisy-le-Roi, France

Filed Mar. 26, 1971, Ser. No. 128,331
Claims priority, application France, Mar. 31, 1970, 7011393
Int. Cl. A41h 37/04
U.S. Cl. 156—66 **7 Claims**



A separable slide fastener includes two rows of fastener elements having at one of their ends a separable coupling device consisting of respective male and female members, said female member being in the form of a housing to receive the male member.

In a process for the manufacture of such a slide fastener, there are provided the steps of manufacturing the housing separately by moulding it from a thermoplastic material, engaging the housing onto an end of a supporting tape for a row of fastener elements, and securing said housing in position on said tape end by driving through a wall of said housing a means serving to force the material of said wall towards the inside of said housing.

3,752,719
METHOD OF MAKING HOSE OR OTHER TUBULAR BODIES OF CURABLE ELASTOMERIC MATERIAL

Clarence W. Borden, Trenton, N.J., assignor to Goodall Rubber Company, Trenton, N.J.

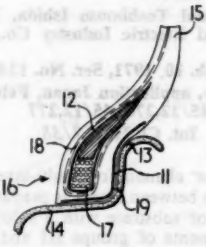
Filed May 15, 1970, Ser. No. 37,572
Int. Cl. B32b 31/20; B29c 27/20
U.S. Cl. 156—84 **10 Claims**

Biaxially oriented heat shrinkable plastic film is wrapped around a mandrel-supported tubular body of uncured elastomeric material so that the application of curing heat will cause the film to shrink in directions which lie axially and circumferentially of the tubular body and remove wrinkles in the film and compress the tubular body.

3,752,720
METHOD OF MAKING PNEUMATIC TIRES

Wilhelm Hamacher, Bruchkobel, and Hubert Leinweber, Hanau am Main, Germany, assignors to Dunlop Limited, London, England

Filed Jan. 6, 1971, Ser. No. 104,207
Claims priority, application Germany, Jan. 15, 1970, P 20 01 706.5
Int. Cl. B29h 17/22
U.S. Cl. 156—132 **7 Claims**

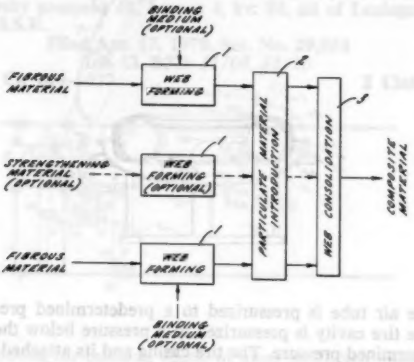


A method of building a tubeless pneumatic tire, comprising a bead region reinforcement of rubberized fleece material, the fibers of which are preferentially orientated substantially perpendicularly to a tire circumference.

3,752,721
FIBRE CONTAINING COMPOSITIONS

Peter Stanley Clark and David William Hobbins, Chur, Switzerland, assignors to Foseco Trading A.G., Chur, Switzerland

Filed June 25, 1970, Ser. No. 49,924
Claims priority, application Great Britain, July 3, 1969, 33,661/69
Int. Cl. B32b *31/14, 31/20*
U.S. Cl. 156—148 19 Claims

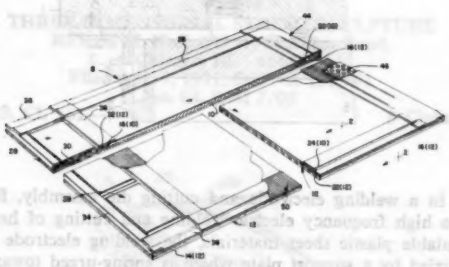


A method for the production of a composite material comprising both fibrous and particulate ingredients includes the steps of forming a web of fibrous material, introducing particulate material onto or into the web, and consolidating the web containing the particulate material. The material so obtained has wide uses, for example as a hot top lining material or a sound insulation material.

3,752,722
METHOD OF MANUFACTURING PHOTOGRAPHIC FILM UNITS

Rogers B. Downey, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 5, 1971, Ser. No. 140,537
Int. Cl. B31f *5/08;* B32b *31/10, 31/18*
U.S. Cl. 156—201 19 Claims

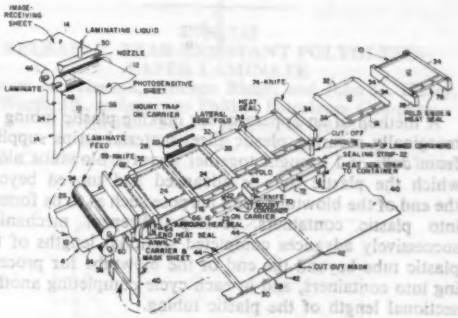


A method of fabricating and assembling a succession of photographic, self-developing film units each including photosensitive and second sheets secured in face-to-face relation at least along one end and two lateral margins; a container of processing liquid; means for collecting and retaining excess processing liquid overrun and spacing means for controlling processing. In the manufacturing method, a succession of spaced apart photosensitive sheets are joined together by narrow connecting strips to form a first web which is superposed with a second and wider web and laminated thereto to form a sandwich by distributing a laminating liquid between the webs while pressing them together and applying heat and pressure to the connecting strips to adhere them to the second web. Other components of the film units including containers, liquid trapping elements and associated components are mounted on the lateral portions of the webs and, as the last operation, the sandwich is severed transversely at the connecting strips to form individual film units.

3,752,723
METHOD OF MANUFACTURING SELF-DEVELOPING PHOTOGRAPHIC FILM UNITS

Louis O. Bruneau, Weston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

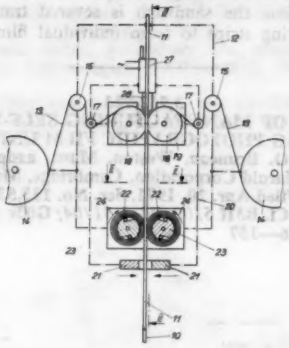
Filed Apr. 20, 1971, Ser. No. 135,539
Int. Cl. B31f *5/00;* B32b *31/04;* G03c *3/00*
U.S. Cl. 156—157 10 Claims



Method of manufacturing a succession of photographic film units each comprising rectangular photosensitive and second sheets secured in face-to-face relation by a combination mask and binding sheet formed with a rectangular exposure opening, secured to the outer surface of the second sheet and having marginal portions folded around the end and lateral margins of the photosensitive and second sheets and adhered to the lateral and at least one end margin of the photosensitive sheet. The film unit also includes a rupturable container of processing liquid mounted adjacent the trailing edge of the photosensitive sheet and having portions defining a liquid discharge passage coupled with the photosensitive and second sheets so as to direct the liquid contents of the container therebetween; and a trapping element secured between the trailing end marginal portion of the binding sheet and the trailing end portions of the photosensitive and second sheets for collecting and retaining excess processing liquid overrun.

During the assembly process, the binding sheet is in the form of an elongated strip which functions as a carrier on which the other components of a succession of film units are mounted as the carrier is moved between and through a succession of work stations at which assembly operations are performed and the components of each film unit are checked for proper assembly. The binding sheet carries the succession of film units through substantially all assembly and inspection steps except for the last two assembly steps in which the lateral edge portions of the binding sheet—which extend transversely of the carrier strip—are folded and adhered to the photosensitive sheet.

3,752,724
METHOD OF AND APPARATUS FOR MAKING FLAT PLASTIC TUBING
Bernhard Seller, Zurich, Switzerland, assignor to Emil Hartmann, Zurich, Switzerland
Filed Aug. 20, 1970, Ser. No. 65,593
Claims priority, application Switzerland, Aug. 26, 1969, 12,944/69
Int. Cl. B32b *31/00, 31/04*
U.S. Cl. 156—351 6 Claims



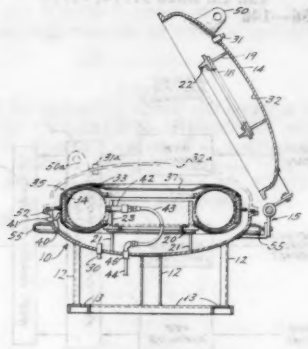
A method of an apparatus for making plastic tubing by marginally securing plastic sheet material strips supplied from coils and brought together about a blowtube along which the plastic tube is advanced and moved beyond the end of the blowtube for a purpose such as to be formed into plastic containers. A step-and-repeat mechanism successively advances completed sectional lengths of the plastic tube beyond the end of the blowtube for processing into containers, and in each cycle completing another sectional length of the plastic tubing.

3,752,725
RESILIENT STRIP MOUNTING FOR PLASTIC BAG FABRICATOR
Max Freeman, 75 Arleigh Road, Great Neck, N.Y. 11021
Filed Apr. 23, 1971, Ser. No. 136,725
Int. Cl. B32b *31/00*
U.S. Cl. 156—367 7 Claims

A plastic bag fabricating, dispensing and sealing unit includes a lid having mounted on it a strip of resilient, nonadherent heat resistant material that engages a heating wire of the unit when the lid is closed, the strip being axially received in a groove that extends along the inner face of the lid. Openings formed at each end of the groove receive a rod that extends through the strip and secures it to the lid. An aperature that extends through the strip parallel to the rod provides the strip with the necessary resiliency.

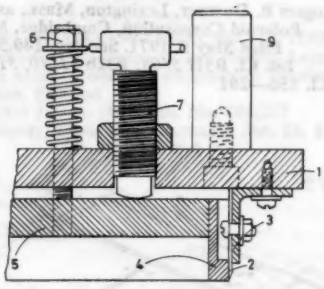
3,752,726
APPARATUS FOR RETREADING TIRES
Carlton Keith Barefoot, 601 Shellbark Road, Muncie, Ind. 47304
Filed Apr. 16, 1971, Ser. No. 134,674
Int. Cl. B29h *5/04, 17/36*
U.S. Cl. 156—394 8 Claims

The present invention is an apparatus for bonding a preshaped layer of retread stock to the periphery of a tire casing. A pair of mating shell members define a tire cavity and receive a tire assembly comprising the tire casing with attached tread stock. The tire assembly is positioned within an elastomeric envelope. A flexible air tube is positioned within the tire assembly in opposed relationship to the envelope. When the mating shell members are in a closed position, air seals are effected between the inner edges of the envelope and the tire beads.



The air tube is pressurized to a predetermined pressure. The tire cavity is pressurized to a pressure below the predetermined pressure. The tire casing and its attached tread stock are held together tightly by the pressure forces. Heat is applied for bonding the retread stock to the tire casing.

3,752,727
DIES FOR HIGH FREQUENCY WELDING AND CUTTING
Gordon Cavell Cox, Rushden, England, assignor to Cox & Wright Limited, Northamptonshire, England
Filed Feb. 23, 1971, Ser. No. 118,109
Claims priority, application Great Britain, Feb. 23, 1970, 8,632/70
Int. Cl. B29c *27/04;* B32b *31/18*
U.S. Cl. 156—510 5 Claims



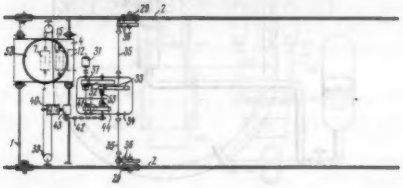
In a welding electrode and cutting die assembly, for the high frequency electric welding and cutting of heat sealable plastic sheet materials, the welding electrode is carried by a support plate which is spring-urged toward a base plate upon which the cutting knife is fixedly secured. The base plate also carries a plurality of fluid-pressure operated rams acting on the support plate so that, when the fluid pressure is applied, the rams thrust the support plate away from the base plate and cause the electrode work-engaging face to protrude beyond the knife edge.

3,752,728

DEVICE FOR MOLDING SHEETS OF GLASS-REINFORCED PLASTICS

Vasily Ivanovich Smirnov, deceased, late of Leningrad, U.S.S.R., by Viktoria Stanislavovna Smirnova, ulitsa Frunze 15, kv. 101, and Valery Vasilievich Smirnov, Vitebsky prospekt 23, korpus 3, kv. 107, both of Leningrad, U.S.S.R., administrators; and Yakov Veniaminovich Epshtein, ulitsa Mayakovskogo 10, kv. 10; Solomon Grigorievich Ginzburg, Bulvar Novatorov 35, kv. 21; Sergei Mikhailovich Ivanov, naberezhnaya r. Fontanki 96, kv. 7; and Nikolai Petrovich Belyaev, Novoizmailovsky prospekt 44, korpus 4, kv. 20, all of Leningrad, U.S.S.R.

Filed Apr. 17, 1970, Ser. No. 29,604
Int. Cl. B32b *31/08, 31/20*
U.S. Cl. 156—577 2 Claims



A device for molding sheets of glass-reinforced plastics having a bridge truss movable in the direction transverse to the truss span and a carriage moving along the truss. Secured on the carriage is a molding head with means for laying, and densifying the sheets of a glass reinforcing material and for impregnating them with binders. The device has with means for providing for a simultaneous movement of the bridge truss and carriage at speeds being in a predetermined ratio, while the molding head is secured on the carriage with the possibility of turning about a vertical axis and fixing in a required direction.

3,752,729

STRENGTHENED GLASS ARTICLE

Ellen L. Mochel, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

No Drawing. Filed May 16, 1966, Ser. No. 550,121
Int. Cl. C03c *3/20, 17/06*
U.S. Cl. 161—1 3 Claims

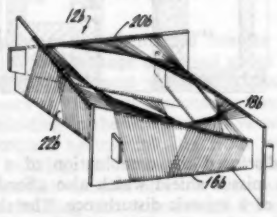
This invention relates to improved glass compositions for use in chemical strengthening wherein the position shape of the temperature versus log viscosity curve is changed by the addition of MgO and optionally K_2O to the glass.

3,752,730

THREE-DIMENSIONAL STRING SCULPTURE

Richard M. Koff, 665 W. Sheridan Road, Chicago, Ill. 60613

Filed Apr. 9, 1971, Ser. No. 132,701
Int. Cl. B44f *7/00*
U.S. Cl. 161—7 5 Claims



A three-dimensional sculpture includes a plurality of members interlocked at their ends to form a polygonal frame. Each of the frame members includes a series of notches formed along their opposing longitudinal edges. A filament such as a string is thereafter passed through the notches on the several frame members to thereby form a highly decorative sculptural pattern enclosed by the frame.

3,752,731

PLASTIC FILM MADE BY A FILM CASTING ARTICLE

Theodore Donald Stiegler and Clyde George Learn, Sr., Richmond, Va., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Original application Dec. 2, 1969, Ser. No. 881,370, now abandoned. Divided and this application Sept. 8, 1971, Ser. No. 178,697
Int. Cl. D06n *7/04*
U.S. Cl. 161—164 1 Claim

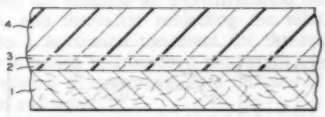
A method of making a film casting article having a casting surface capable of imparting to polymeric film cast thereon and stripped therefrom desirable optical and slit-roll formation properties. The casting surface of the film casting article is polished, blasted with grit, and stoned and polished again to impart critical "roughness" characteristics to such casting surface.

3,752,732

REUSABLE, TEAR-RESISTANT POLYOLEFIN-PAPER LAMINATE

Lenart A. Peterson, Chicago Ridge, and John G. Finley, Worth, Ill., assignors to Phillips Petroleum Company

Filed Feb. 24, 1970, Ser. No. 13,413
Int. Cl. B32b *7/06, 13/12, 27/08*
U.S. Cl. 161—165 5 Claims



A tough, tear-resistant, reusable, well-bonded polyolefin-paper laminate is formed by laminating a polyolefin film, preferably oriented, to a paper substrate by means of a melt of a polymer containing the same olefin as used in the film.

3,752,733

BONDED NONWOVEN FIBROUS PRODUCT

Paul R. Graham, Ballwin, Morris V. Merchant, Florissant, and August F. Ottinger, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Oct. 29, 1969, Ser. No. 872,412
Int. Cl. D04h *3/12, 5/04*
U.S. Cl. 161—170 23 Claims

Bonded, nonwoven fibrous products bonded with a composition consisting essentially of an ethylene/vinyl chloride interpolymer, containing 5 to 70 percent ethylene, 30 to 95 percent vinyl chloride and 0.1 to 10 percent acrylamide or acrylamide/polar monomer mixtures.

3,752,734

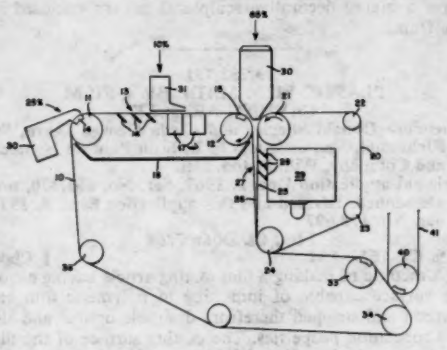
MULTI-PLY PAPER MACHINE

Willard C. Notbohm, Watertown, N.Y., assignor to The Black Clawson Company, Hamilton, Ohio

Filed Aug. 12, 1970, Ser. No. 63,076
Int. Cl. D21f *11/04*
U.S. Cl. 162—123 10 Claims

A multi-ply paper machine utilizes a pair of forming belts with one belt having horizontal and vertical runs and the second belt having a vertical run in opposition to the vertical run of the first belt and defining therewith a vertically extending forming zone. Papermaking stock

is deposited on the horizontal run of the first belt and liquid drains therefrom as it progresses towards the vertical forming zone. The major portion of the stock making



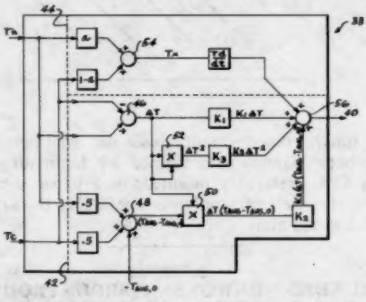
up the finished web is then deposited in the vertical forming zone, with principal drainage of this stock deposition being through the vertical run of the second belt.

3,752,735

INSTRUMENTATION FOR NUCLEAR REACTOR CORE POWER MEASUREMENTS

Charles R. Musick, Rockville, Conn., and Richard P. Remshaw, Brooklyn, N.Y., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed July 16, 1970, Ser. No. 55,331
Int. Cl. G21c *17/00*
U.S. Cl. 176—19 **8 Claims**



In a nuclear reactor system, at least two independent measures of reactor core power are provided with one being dependent on neutron flux and the other on coolant thermal parameters. The two independent measures of core power are interrelated in a manner which exploits the advantages of each while avoiding inherent limitations of either to provide a more accurate determination of core power for a variety of system conditions.

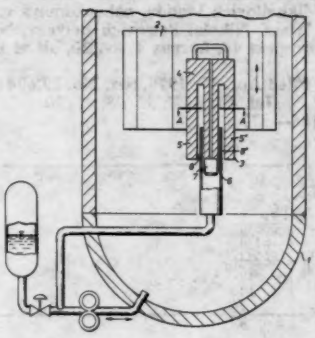
3,752,736

CONTROL ROD ARRANGEMENT PARTICULARLY FOR BOILING WATER REACTORS

Heinz Kornbichler, Falkenstein, and Peter Seidle, Niederneisen, Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Germany

Filed Sept. 30, 1971, Ser. No. 185,143
Claims priority, application Germany, Sept. 30, 1970, P 20 48 029.9
Int. Cl. G21c *7/10*
U.S. 176—36 R **5 Claims**

An improved control rod arrangement for a nuclear reactor, and in particular a boiling water reactor, of the type wherein the absorber portion of the control rod has a cross-shaped cross section, a coaxial guide tube is provided for guiding the control rod outside of the reactor and the control rod is provided with a lifting piston which cooperates with a lifting cylinder to insert the control rod into the reactor core from the bottom. According to the



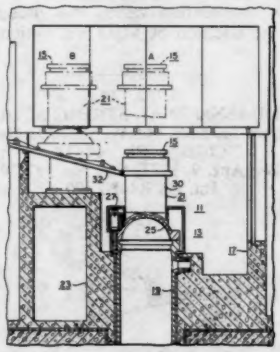
invention, the control rod guide tube is designed to simultaneously serve as the lifting cylinder and the absorber portion of the control rod is designed so that the four wings of the cross-shaped cross section will pass over the control rod guide tube, e.g. by providing each of the wings with an upwardly extending slit.

3,752,737

COMBINATION OF NUCLEAR REACTOR AND MISSILE SHIELD

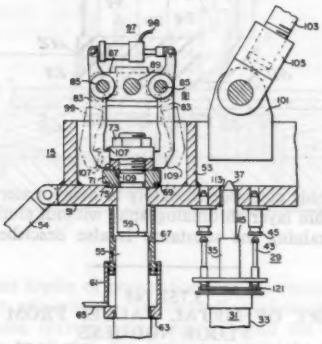
Erling Frisch, Pittsburgh, and Harry N. Andrews, Export, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 8, 1970, Ser. No. 53,200
Int. Cl. G21c *9/00*
U.S. Cl. 176—38 **11 Claims**



There is disclosed the combination of a nuclear reactor with a missile shield which also affords protection in the event of a seismic disturbance. The shield is massive plate of steel or the like with ribs and is mounted above, and connected to, the upper package of the reactor. The plate has holes through which projections from the

housings of the retracting mechanism clusters for the control rods pass. In the event of a seismic disturbance the movement of the mechanism clusters is limited by the restraint exerted by the shield plate on the projections. In



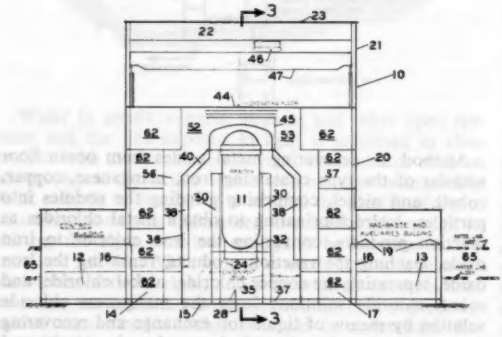
addition the shield is retractable from the upper package by operation of hydraulic pistons and when retracted locks the rod retracting mechanisms for a refueling operation.

3,752,738

NUCLEAR REACTOR PLANT AND MULTIPLE PURPOSE SHIELDING SYSTEM THEREFOR

Sherman Naymark, San Jose, Calif., assignor to Nuclear Services Corporation, Campbell, Calif.

Filed July 6, 1970, Ser. No. 52,384
Int. Cl. G21c *13/00*
U.S. Cl. 176—87 **19 Claims**



A multipurpose compartmented reactor building in which water fillable tankage dispersed about the pressure vessel and the containment vessel of a nuclear reactor provide primary shielding of a primary pressure boundry; secondary shielding in the containment vessel therefor as well as protection against missiles from within and/or without the building; the tankage further providing multiple and immediate sources of water for emergency cooling and for flooding the containment boundry around the pressure vessel in the event of vessel rupture to keep the reactor core submerged; the tankage and water therein serving to absorb the energy release generated in a nuclear accident; such tankage when empty rendering the building light enough to be floatable as a hull for transport from a place of the construction to mooring at a site of ultimate use where the water sustaining the hull serves as a seismic damper to the hull in the event of an earthquake.

3,752,739

RECOVERY OF A CULTIVATED MICRO-ORGANISM AND OF RESIDUAL SUBSTRATE EMPLOYED IN THE CULTIVATION

Jean Amaudric du Chaffaut, Marseille, France, assignor to The British Petroleum Company Limited, London, England

No Drawing. Continuation of abandoned application Ser. No. 743,635, July 10, 1968. This application Nov. 15, 1971, Ser. No. 198,965
Claims priority, application Great Britain, July 19, 1967, 33,088/67
Int. Cl. A23j *1/18*
U.S. Cl. 195—28 R **8 Claims**

Aerobic cultivation of a micro-organism, for example Candida tropicalis, in the presence of a feedstock which consists of or contains a hydrocarbon and on which said micro-organism is capable of growth; thereafter separating part of the aqueous nutrient medium; thereafter treating the remaining product or part thereof comprising the micro-organism in admixture with at least part of the residual hydrocarbon and at least part of the residual nutrient medium, with a surface active agent consisting of or containing a surface active agent having the formula:

$$CH_3—(CH_2)_n—O—CH_2—(CH_2—O—CH_2)_m—CH_2—O—SO_3X$$

where n is an integer from 11 through to 14 and m is an integer from 4 through to 12 and where X is sodium or potassium, for example an oxyethylenated lauric alcohol sulphate, and thereafter subjecting the mixture so obtained to a separation treatment for the recovery of a fraction in which hydrocarbon predominates and a fraction consisting of or containing a mixture of the micro-organism and water.

Preferably the fraction in which hydrocarbons predominate and which will contain some aqueous medium held in emulsion and comprising surface active agent, is treated with a compound containing a metal ion which forms a water insoluble salt with said surface active agent, for example calcium hydroxide. After removal of the precipitated salt a hydrocarbon product free of surface active agent may be obtained.

3,752,740

PROCESS FOR PRODUCING β-CAROTENE

Oldrich K. Sebek, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Jan. 22, 1964, Ser. No. 339,331
Int. Cl. C12d *5/00*
U.S. Cl. 195—28 R **3 Claims**

A process for producing increased titers of β-carotene which comprises fermenting *Blakeslea trispora* in an aqueous fermentation medium containing at least 7½% citrus molasses.

3,752,741

EXTRACTION OF PROTEASES

Monique Courtois, 5 Rue Auguste Barbier, Paris, France, and Bernard Ores, 13 Rue Bataille, Montreuil Sous Bois, France

No Drawing. Filed May 24, 1971, Ser. No. 146,550
Claims priority, application France, June 3, 1970, 7020365
Int. Cl. C07g *7/028*
U.S. Cl. 195—66 R **5 Claims**

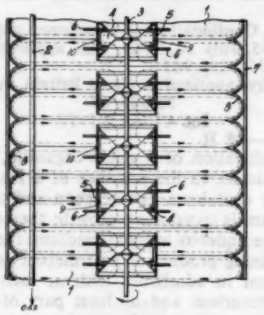
A novel process for the extraction of proteases active in alkaline medium from fermentation broths in which the proteases are produced by microorganisms, by adsorption on a non-ionic resin and elution with a solvent.

3,752,742

PROCESS AND APPARATUS FOR THE AEROBIC FERMENTATION OF SUBSTRATES

Gerhard Jaekel, Hurth-Hermulheim, Kurt Karrenbauer, Liblar, Eitel Goedicke, Hurth-Efferen, and Dieter Kirstein, Cologne, Germany, assignors to Knapsack Aktiengesellschaft, Knapsack, near Cologne, Germany

Filed Aug. 30, 1971, Ser. No. 175,815
Claims priority, application Germany, Aug. 31, 1970, P 20 43 077.7
Int. Cl. C12b *1/14*
U.S. Cl. 195—109 2 Claims



Substrates are subjected to continuous aerobic fermentation or highly polluted effluent from organic chemical production facilities is continuously purified in the presence of micro-organisms in a biochemical reaction zone by aeration with an oxygen-containing gas. To this end the oxygen-containing gas is introduced into the biochemical reaction zone having a liquid phase therein, and while flowing therethrough, it is continually transformed with the resultant formation of fresh-surfaced gas bubbles and reduction of the time of contact between the gas in the bubbles and the liquid phase at any surface therebetween.

3,752,743

BIOLOGICAL INDICATOR

Jack R. Henshilwood, Highland, Ind., assignor to Colab Laboratories, Inc.

Filed Mar. 15, 1972, Ser. No. 234,726
Int. Cl. C12k *1/10*
U.S. Cl. 195—127 5 Claims

A sterilizing test device is provided for testing the completeness of sterilization procedures. The device comprises a semi-rigid transparent envelope with separate compartments for gas access, for the culture medium and for a source of micro-organisms, the compartments being interconnected so that the culture medium can be passed into contact with the micro-organisms and so that external air will be provided to the micro-organisms during their culture growth.

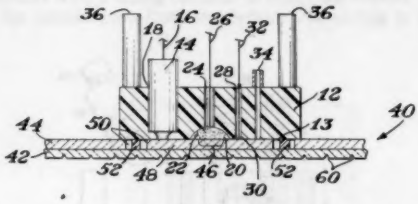
3,752,744

POLAROGRAPHIC ELECTRODE METHOD

Robert R. Fike, Indianapolis, Ind., assignor to The Dow Chemical Company, Midland, Mich.

Original application Sept. 2, 1969, Ser. No. 854,660. Divided and this application Apr. 26, 1972, Ser. No. 247,825
Int. Cl. G01n *27/46*
U.S. Cl. 204—1 T 3 Claims

A polarographic electrode assembly comprising a confined working electrode is described. The electrode assembly is adapted to fit against a portion of a thin layer chromatogram to form a polarographic cell in which the electrodes of the electrode assembly are all in the contact with an isolated zone of the thin layer containing a spot of substance to be assayed. A method of using the



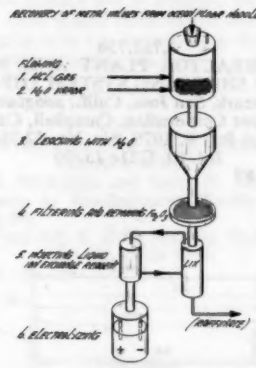
polarographic electrode assembly to assay materials separated by thin layer chromatography without elution of the spots containing the substance is also described.

3,752,745

RECOVERY OF METAL VALUES FROM OCEAN FLOOR NODULES

William S. Kane, Newport News, and Paul H. Cardwell, Zanoni, Va., assignors to Deepsea Ventures, Inc., Gloucester Point, Va.

Filed May 12, 1971, Ser. No. 142,697
Int. Cl. C22d *5/08, 5/18, 5/30*
U.S. Cl. 204—105 M 19 Claims



Method for recovering metal values from ocean floor nodules of the type containing iron, manganese, copper, cobalt, and nickel, comprising grinding the nodules into particles, hydrochlorinating to obtain metal chlorides as reaction products, converting the iron chloride to iron oxide, leaching the reaction products, removing the iron oxide, separating the copper chloride, nickel chloride, and cobalt chloride solutions from the manganese chloride solution by means of liquid ion exchange and recovering the metal values by electrolyzing or by aluminothermal reduction.

3,752,746

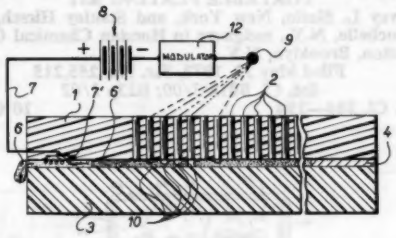
ELECTROLYTIC PRINTING METHOD AND SYSTEM

Adrien Castegnier, Montreal, Quebec, Canada (325 Melbourne Ave., Mount Royal, Quebec, Canada)

Filed Feb. 25, 1972, Ser. No. 229,303
Int. Cl. G01k *3/00*
U.S. Cl. 204—130 24 Claims

A printing method and system adapted to replace photography, cinematography and photocopying but which do not use any photosensitive film. A printing method and

system which consists of electrically imprinting an image into an electrically reactive layer. In particular, an electrolytic printing method and system wherein electrodes are arranged in contact with a suitable viscous electrolyte layer to produce, upon selective energization, gas bubbles

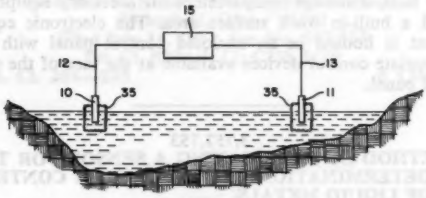


of different depths of penetration into the viscous electrolyte layer adjacent the corresponding electrodes, therefore making corresponding imprints into the layer and thereafter hardening the latter to retain the image reproduced.

3,752,747
METHOD FOR CONTROLLING ALGAE POLLUTION

Richard W. Treharne, Xenia, Ohio, and Thomas E. Brown, Absecon, N.J., assignors to Kettering Scientific Research, Inc., Yellow Springs, Ohio

Filed Nov. 16, 1970, Ser. No. 89,983
Int. Cl. C02b *1/82*; C02c *5/12*
U.S. Cl. 204—149 **12 Claims**



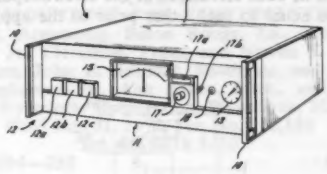
Water in ponds, aquaria, streams and other open systems and the like exposed to light is subjected to electrolysis with electrochemically inert electrodes or with an electrochemically active anode and an electrochemically inert cathode to destroy or to control the growth of algae. A current density is maintained at a level high enough to destroy the algae, and low enough to be harmless to human and fish life. When an active anode is used it releases metal ions toxic to algae, and a detector electrode is used to sense the toxic ion concentration so that a predetermined concentration lethal to algae is maintained. Essentially the same system may be used for the destruction of bacteria, such as *E. coli, R. rubrum,* Chromatium, Azotobacter, *R, rubrum* mutant (R–26), and the like.

3,752,748
OZONE GENERATING APPARATUS AND METHOD

Robert D. McMillan, Jr., Houston, Tex., assignor to McMillan Electronics Corporation, Houston, Tex.

Filed Apr. 19, 1971, Ser. No. 135,158
Int. Cl. B01k *1/00*; B01j *1/10*
U.S. Cl. 204—157.1 R **16 Claims**

An ozone generating apparatus and method providing substantially constant, controlled concentrations of ozonized gas for repeated operating cycles or for sustained lengths of operating time and capable of being

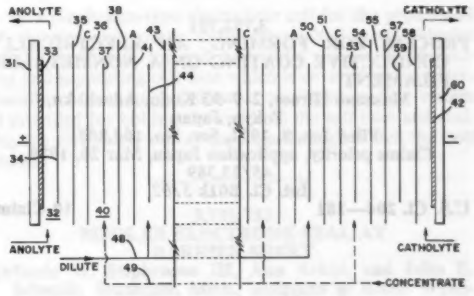


quickly and accurately calibrated to insure accuracy of the ozone concentrations generated.

3,752,749
ELECTRODIALYTIC REMOVAL OF ACID FROM AQUEOUS EFFLUENT

Frederick P. Chlanda, New Brunswick, Harry P. Gregor, Leonia, and Kang-Jen Liu, Somerville, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Sept. 27, 1971, Ser. No. 183,923
Int. Cl. B01d *13/02*
U.S. Cl. 204—180 P **6 Claims**



The electrodialytic concentration and removal of acids from aqueous effluents, e.g., malic acid effluent containing less than about 10% malic acid, to produce two streams, a relatively concentrated aqueous concentrate stream of about 30% acid and a relatively dilute stream of less than about 0.3% acid, is disclosed. The process, continuous, semicontinuous or batch offers a practical solution from the standpoint of meeting pollution control standards and for separating or recovering acids which may be returned to the process by direct recycling.

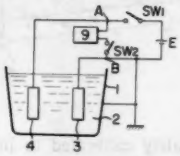
3,752,750
METHOD FOR ELECTRODEPOSITION

Akira Matsushita and Rokuro Fukushima, Kawasaki, Japan, assignors to Akira Matsushita and Takeo Kagitani

Filed May 28, 1970, Ser. No. 41,329
Claims priority, application Japan, May 30, 1969, 44/49,690; May 31, 1969, 44/42,670, 44/42,671
Int. Cl. B01k *5/02*; C23b *13/00*
U.S. Cl. 204—181 **5 Claims**

There are described new methods of coating a substate adapted to function as an anode with an electrodeposited layer in an electrodeposition bath containing therein an

electrodepositing liquid prepared by adding at least one of inorganic pigments, magnetic particles and dielectric particles, semiconductive particles, organic pigments, and their mixture to anionic solubilised resin formed by dispersing pigments (for example, a water-soluble alkyd resin containing 10 percent of solids), in which electric potentials of both electrodes of the electrodeposition bath are made equal to each other prior to the application of



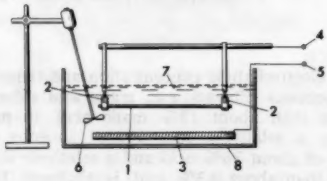
an electric voltage across them by maintaining electric potential of the substrate at a value lower than that of the electrodepositing liquid or by short-circuiting said both electrodes thereby to discharge the electric charge stored in said electrodepositing liquid, whereby formation of uniform electrodeposited layer on the substrate can be made possible under a constant initial condition of the electrodeposition. Furthermore, apparatuses adapted to carry out the above-mentioned methods are disclosed.

3,752,751

PROCESS FOR FORMING AN ELECTRICALLY CONDUCTIVE COATING ON A NONMETALLIC FILAMENT

Masanao Hirose, 2–9–93 Kodo, Adachi-ku, Tokyo, Japan

Filed Jan. 8, 1971, Ser. No. 104,855
Claims priority, application Japan, Mar 20, 1970, 45/23,389
Int. Cl. B01k *5/02*
U.S. Cl. 204—181 **10 Claims**



A process for forming an electrically conductive coating on the surface of a nonmetallic filament, characterized in that said nonmetallic filament is carried by electrically conductive members and placed in an electro-depositing coating material comprising electrically conductive particles dispersed in a resinuous carrier with a concentration of 15–25%, preferably 18–20% by weight, said conductive members which serve as one electrode and the other electrode located in said electro-depositing coating material being electrified with a D.C. voltage, thereby forming a coating of a uniform and desired thickness on the surface of said nonmetallic filament. In the process according to this invention, an electric conductor employing a nonmetallic filament as a carrier or base and having a desired electric resistance can be easily and surely obtained by controlling the D.C. voltage, current density or electrifying period for electro-deposition, employing simple and economical electro-depositing coating devices.

3,752,752

PORTABLE PLATING KIT

Harvey L. Slatin, New York, and Stanley Hirsch, New Rochelle, N.Y., assignors to Harstan Chemical Corporation, Brooklyn, N.Y.

Filed May 22, 1972, Ser. No. 255,215
Int. Cl. B01k *3/00*; B23p *1/02*
U.S. Cl. 204—194 **10 Claims**

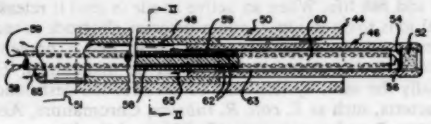
A portable electroplating kit contained in a carrying case and providing the necessary equipment for a complete plating laboratory and prototype plating machine including a rectifier, a pump, a magnetic stirrer, a source for heat, a storage compartment for accessory equipment and a built-in work surface area. The electronic equipment is housed in an enclosed control panel with appropriate control devices available at the face of the control panel.

3,752,753

METHOD OF FABRICATING A SENSOR FOR THE DETERMINATION OF THE OXYGEN CONTENT OF LIQUID METALS

George R. Fitterer, 825 12th St., Oakmont, Pa. 15139

Continuation-in-part of application Ser. No. 786,866, Dec. 23, 1968, which is a continuation-in-part of application Ser. No. 570,855, Aug. 8, 1966, now abandoned. This application Apr. 30, 1971, Ser. No. 139,018
Int. Cl. G01n *27/46*
U.S. Cl. 204—195 S **22 Claims**



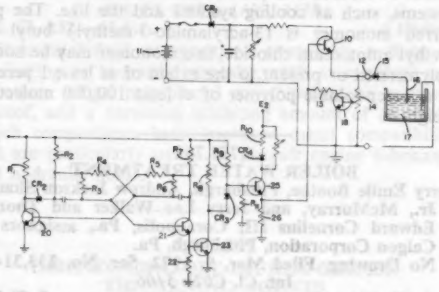
A method for fabricating a direct reading oxygen probe structure for insertion into high temperature liquid metal comprises the steps of inserting a relatively closely fitting mass of an electrolyte material into one end of an insulating envelope, and heating the envelope to a sintering temperature of the mass at a temperature and time interval sufficient to sinter and seal the mass to the envelope. Desirably, the envelope and mass are sized and shaped so as to be capable of withstanding thermal shock upon contacting the liquid metal.

3,752,754

POWER SUPPLY FOR PULSE ELECTROPLATING

Roger A. Olson and Norman M. Osero, Amery, Wis., and Pat F. Mentone, St. Paul, Minn., assignors to Buckbee-Mears Company, St. Paul, Minn.

Filed Jan. 31, 1972, Ser. No. 222,221
Int. Cl. B01k 3/00
U.S. Cl. 204—228 5 Claims



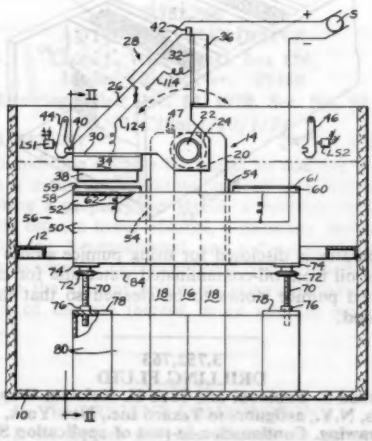
A solid state switching device connected to an energy source is turned on and off by the signal output from a multivibrator to pass pulses of energy through an output terminal to an electrode located in an electroplating bath. A circuit coupled to the switch and output terminal limits the magnitude of the output pulse.

3,752,755

DEBURRING APPARATUS

Frederick G. Krafft, 2975 Fox Hollow Road, Springfield, Ohio 45502

Filed July 15, 1971, Ser. No. 162,933
Int. Cl. B23p 1/12; C23b 5/70
U.S. Cl. 204—225 6 Claims



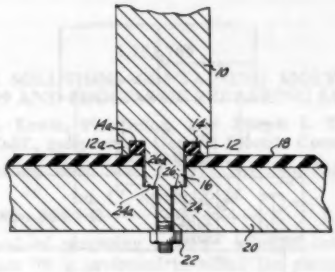
The specification discloses an electrolytic deburring machine having a tiltable work support table arranged so that when one work piece on a work station thereon is in working position, the other work station of the machine is tilted upwardly for being loaded. The machine is provided with a non-conductive tank to contain the electrolyte and in which the base and tiltable work support table are mounted. All components of the machine exposed to the electrolyte, other than the work piece supporting member, is constructed of electrically non-conductive material, such as alumina, or fiberglass, or the like.

3,752,756

ANODE MOUNTING FOR ELECTROLYTIC CELL

Phillip E. Armstrong, Baton Rouge, La., Webster L. Kaiser, Jr., Cleveland, Tenn., and Newlin S. Nichols, Dearborn, John E. Schmidt, Southgate, and Orlando W. Stephenson III, Ann Arbor, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jan. 31, 1972, Ser. No. 222,108
Int. Cl. B01k 3/10
U.S. Cl. 204—252 6 Claims



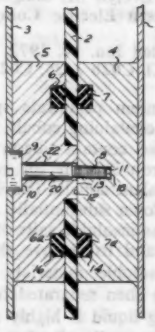
In a diaphragm-type electrolytic cell for the production of chlorine and caustic alkali from alkali metal chlorine solutions wherein the cell has metal anodes, a conducting and supporting cell base which is covered with an electrically non-conductive sheet, a two-point sealing system is provided for bolting the anode to the cell base and sealing the electrolyte out of the hole through which the bolt passes.

3,752,757

BIPOLAR ELECTRODE SEAL AT BARRIER SHEET

Orlando W. Stephenson III, Ann Arbor, and John E. Schmidt, Southgate, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed June 7, 1972, Ser. No. 260,395
Int. Cl. B01k 3/10
U.S. Cl. 204—256 5 Claims



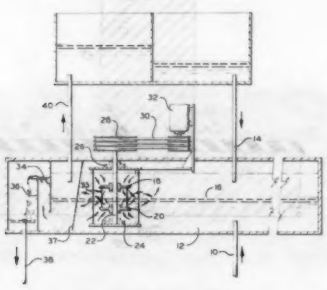
In a filter press cell for the electrolytic production of chlorine from aqueous alkali metal chloride solu-

tions and having adjacent pairs of anodes and cathodes mechanically and electrically inter-connected, a two point sealing system is provided for bolting the anode to the cathode and sealing out the electrolyte from the hole through which the connection passes.

3,752,758
METHOD OF SEPARATING SOLID FROM LIQUIDS

Ahmad M. El-Hindi, Ridge Road, Fabius, N.Y. 13063, and Ralph G. Jaeggli, Sky High Road, Tully, N.Y. 13159

Filed July 15, 1971, Ser. No. 162,771
Int. Cl. B01d *12/00*
U.S. Cl. 210—21 **3 Claims**



A method of removing solid contaminants from a liquid wherein the solid particles have a weight-to-buoyancy ratio approaching unity. The contaminated liquid is placed in a container with a significantly heavier or lighter liquid, forming an interface. The two liquids are mutually immiscible and are forced together to be thoroughly interspersed with one another and then allowed to separate again. The solid particles are thereby wetted to some extent by the initially clean liquid and tend to remain therein after the liquids separate, thus being removed from the initially contaminated liquid.

3,752,759
DEPURATION OF AN AQUEOUS SOLUTION CONTAINING VANADIUM AND COBALT SALTS AS IMPURITIES

Martin S. Burg, Western Springs, Lynn M. Carbonaro, Oak Park, and Evelyn M. Songco, Chicago, Ill., assignors to Western Electric Company, Incorporated, New York, N.Y.

No Drawing. Filed Jan. 14, 1972, Ser. No. 218,006
Int. Cl. C02b *1/26;* **C02c** *5/02*
U.S. Cl. 210—50 **7 Claims**

Acidified ammonium persulfate spent as etchant for vicalloy (an alloy containing cobalt, vanadium, and iron and which may also contain silicon and manganese) is treated with an iron reagent for reducing pentavalent vanadium and trivalent cobalt. The solution is then neutralized to throw down substantially all of the vanadium from the solution as insoluble salts of trivalent and tetravalent vanadium, and to remove the iron as iron hydroxide. These insoluble materials, together with any silicon dioxide, are then separated from the liquid. The pH of the resulting liquid is highly alkalinized to throw out therefrom substantially all of the cobalt and the remaining iron as insoluble materials of bivalent cobalt and iron hydroxide. These last insoluble materials are then separated from the liquid, which is thereafter neutralized.

3,752,760
SILT REMOVAL

Robert Cornelius Gordon, Jr., Rochester, Jerry Lee Walker, Coraopolis, Andrew Jackson Sharpe, Jr., McMurray, and Jerry Emile Boothe, Pittsburgh, Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

No Drawing. Filed Mar. 9, 1972, Ser. No. 233,322
Int. Cl. C02b *5/06*
U.S. Cl. 210—58 **8 Claims**

Polymers of certain N-(alkyl) amino acrylamides are useful to remove and prevent silt accumulations in water systems, such as cooling systems and the like. The preferred monomer is (3-acrylamido-3-methyl) butyl trimethyl ammonium chloride; this monomer may be homopolymerized or present to the extent of at least 1 percent in a water-soluble polymer of at least 100,000 molecular weight.

3,752,761
BOILER WATER TREATMENT

Jerry Emile Boothe, Pittsburgh, Andrew Jackson Sharpe, Jr., McMurray, and Jerry Lee Walker and Thomas Edward Cornelius III, Coraopolis, Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

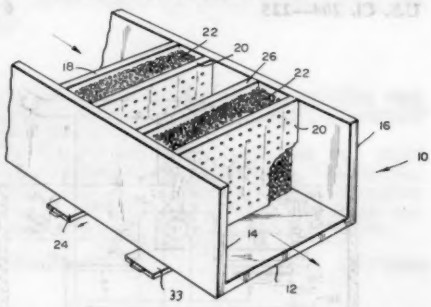
No Drawing. Filed Mar. 9, 1972, Ser. No. 233,314
Int. Cl. C02b *5/06*
U.S. Cl. 210—58 **7 Claims**

It is disclosed that polymers containing at least 1 percent by weight of (3-acrylamido-3-methyl) butyl trimethyl ammonium chloride and/or related monomers perform as excellent boiler water dispersives and conditioners. The polymer should have an average molecular weight of at least 10,000.

3,752,762
APPARATUS FOR REMOVING OIL FROM OIL-CONTAMINATED WATER

John Cincotta, 24—33 W. 3rd St., Brooklyn, N.Y.

Filed Apr. 5, 1971, Ser. No. 131,254
Int. Cl. B01d *15/06*
U.S. Cl. 210—32 **1 Claim**



Apparatus is disclosed for using pumice stones for removing oil from oil-contaminated water and for enabling saturated pumice stones to be cleaned so that they can be reused.

3,752,763
DRILLING FLUID

Mahmoud S. Kablaoui and Jack H. Kolaian, Wappingers Falls, N.Y., assignors to Texaco Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 84,458, Oct. 27, 1970, now abandoned. This application Apr. 26, 1972, Ser. No. 247,642
The portion of the term of the patent subsequent to Feb. 15, 1989, has been disclaimed
Int. Cl. C10m *3/14, 3/20*
U.S. Cl. 252—8.5 C **10 Claims**

An aqueous drilling fluid dispersant and a method of drilling wells using as the drilling fluid dispersant a 4-vinyldihydroxybenzene compound.

3,752,764

FUNCTIONAL FLUID COMPOSITIONS

James D. Sullivan, Chesterfield, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 796,885, Feb. 5, 1969, now Patent No. 3,591,500, dated July 6, 1971, which is a continuation-in-part of abandoned application Ser. No. 540,488, Apr. 6, 1966. This application June 23, 1971, Ser. No. 156,134

Int. Cl. C10m *1/32, 1/38*

U.S. Cl. 252—47.5 4 Claims

Functional fluid compositions comprising a fluid of lubricating or hydraulic viscosity, such as a polyphenyl thioether, mixed polylphenyl oxy-thioether or mixtures thereof, and a corrosion inhibiting amount of an azole, which compositions have improved metal compatibility and are particularly useful as aircraft engine lubricants and hydraulic fluids.

3,752,765

DIBENZIMIDAZOLE-DIUREA GREASE THICKENING AGENTS

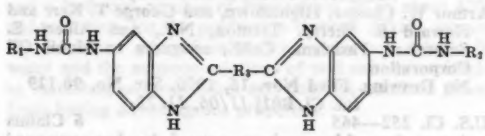
August H. Birke, Godfrey, Ill., assignor to Shell Oil Company, New York, N.Y.

No Drawing. Filed Aug. 5, 1971, Ser. No. 169,460

Int. Cl. C10m *3/26*

U.S. Cl. 252—51.5 A 8 Claims

Dibenzimidazole-diurea compounds corresponding to the formula:



wherein R_1 and R_2 are hydrocarbyl radicals and R_3 is a hydrocarbylene radical, are highly efficacious grease thickening agents.

3,752,766

AUTOMOTIVE ADDITIVE

Clyde L. Wilson, P.O. Box 126, Incline Village, Nev. 89450

No Drawing. Filed Dec. 14, 1970, Ser. No. 98,194

Int. Cl. C10m *1/20, 1/24*

U.S. Cl. 252—57 6 Claims

A composition suitable for use as an additive to motor oils, as a motor oil substitute, and/or as a fuel additive comprising a polyalkylene glycol, a hydroxyl-containing aromatic ester, a lower alkanol, a naturally derived aromatic ketone, 3-p-menthanol, and a dyestuff which composition is superior to conventional oils and/or fuels with regard to the amount pollutants generated therefrom as a result of the use thereof in an internal combustion engine.

3,752,767

LUBRICANT COMPOSITION

Rudolf J. A. Eckert and Jan Heemskerk, Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y.

No Drawing. Filed June 22, 1971, Ser. No. 155,634

Claims priority, application Great Britain, July 1, 1970, 31,798/70

Int. Cl. C10m *1/18*

U.S. Cl. 252—59 6 Claims

Lubricant compositions comprising hydrogenated random copolymers of a conjugated diene and a vinylaromatic compound and a suitable lubricating oil have improved viscosity properties.

3,752,768

CURING AGENT

John F. Thompson, Morenci, and Townsend H. Porter, Adrian, Mich., assignors to Anderson Development Company, Adrian, Mich.

No Drawing. Filed Aug. 23, 1971, Ser. No. 174,199

Int. Cl. C07c *87/54;* C08f *45/72*

U.S. Cl. 252—182 7 Claims

A liquid composition useful for curing epoxy resins, urethane foams and urethane elastomers is prepared by condensing aniline, 2-chloroaniline, 2,5-dichloroaniline and formaldehyde in certain ratios in the presence of an acid.

3,752,769

STABLE SOLUTIONS CONTAINING MOLYBDENUM-99 AND PROCESS OF PREPARING SAME

Robert E. Lewis, Pleasanton, and Joseph I. Tenorio, Niles, Calif., assignors to General Electric Company

No Drawing. Filed Mar. 4, 1971, Ser. No. 121,183

Int. Cl. A61k *27/04*

U.S. Cl. 252—301.1 R 8 Claims

A method of preparing a stable solution containing molybdenum 99 is presented in which the starting material of molybdenum trioxide containing the molybdenum-99 isotope is dissolved in a sufficient amount of an aqueous ammonium hydroxide to give an ammonium molybdate solution having a pH in the range of about 7.5 to about 9.5. The solution is then filtered to remove any suspended solids, and from about 0.12 to about 0.60 weight percent of sodium hypochlorite in the form of an aqueous solution is added to the ammonium molybdate solution. This process gives a stable ammonium molybdate solution with a pH in the range of about 7.5 to about 9.5 comprising from about 0.12 to about 0.60 weight percent sodium hypochlorite, up to about 0.46 gram of ammonium molybdate per milliliter of solution and the balance water. The stable ammonium molybdate solution remains water-clear and free of discoloration from radiolytic reduction of molybdenum for the usual life of the solution.

3,752,770

MULTIFUNCTIONAL EMULSIFICATION AGENTS

Bruce D. Buddemeyer, Morris Plains, N.J. (D3 Birchwood Drive, Fredonia, N.Y. 14063)

No Drawing. Filed May 13, 1970, Ser. No. 37,014

Int. Cl. B01f *17/34, 17/36*

U.S. Cl. 252—356 7 Claims

There are disclosed powdered, free flowing, relatively non-hygroscopic emulsification compositions for improving the physical properties and quality of food products and especially carbohydrate containing food products, confections and prepared mixes. The emulsification agents are compositions of matter which contain co-acting constituents consisting essentially of (a) from 20 to 80 parts by weight of at least one of the aliphatic polyol esters of the fatty acids having from 10 to 24 carbons, glyceryl lactopalmitate, glyceryl lactostearate, succinylated monoglycerides, and acetylated tartaric acid esters of mono- and diglycerides, (b) from 80 to 20 parts by weight of at least one polyoxyethylene derivative of any of said polyol esters of fatty acids and having a total of from about 5 to 100 moles of ethylene oxide per mole of said polyol ester; and (c) a hydrogenated triglyceride to the extent of from 20 to 80 weight percent of said composition.

3,752,771
SYNTHESIS GAS PRODUCTION BY PARTIAL OXIDATION

Roger M. Dille, La Habra, and Warren G. Schlinger, Pasadena, Calif., assignors to Texaco Inc., New York, N.Y.

No Drawing. Continuation-in-part of applications Ser. No. 649,490, June 28, 1967, and Ser. No. 692,306, Dec. 21, 1967. This application June 19, 1969, Ser. No. 834,879
Int. Cl. C07c *1/02*
U.S. Cl. 252—373 15 Claims

In a high pressure synthesis gas generating process continuous control of the pH in the system may be accomplished by supplementing the nitrogen in the primary hydrocarbon fuel and oxygen-enriched gas fed to the generator with a controlled amount of nitrogen in the form of nitrogen containing organic compounds, and continuously neutralizing all or a portion of the formic acid produced in the system with ammonia synthesized in the system. Carbon-steel process equipment and piping is thereby protected from corrosion and system upsetting emulsions are prevented from forming in the carbon recovery zone.

3,752,772
PREPARATION OF CATALYST FROM KAOLIN CLAY

John P. Horzepa, Edison, N.J., assignor to Engeland Minerals & Chemicals Corporation, Woodbridge, N.J.

No Drawing. Filed June 25, 1971, Ser. No. 157,019
Int. Cl. B01j *11/40, 11/44*
U.S. Cl. 252—448 6 Claims

A mixure of hydrated kaolin clay and calcined kaolin clay (metakaolin form) or partially rehydrated metakaolin is formed into particles such as extruded pellets. The particles are calcined at about 1350° F. to convert the hydrated clay into metakaolin. The particles are then immersed in water and heated under superatmospheric pressure to provide a cracking catalyst.

3,752,773
PREPARATION OF CATALYSTS

Roy B. Duke, Jr., and Larry M. Echelberger, Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio

No Drawing. Filed Nov. 28, 1969, Ser. No. 880,958
Int. Cl. B01j *11/40;* C10b *33/20*
U.S. Cl. 252—454 19 Claims

This disclosure describes a method for preparing catalysts resistant to attrition or other types of physical degradation. The catalysts are formed by blending catalyst precursors, such as metallic hydroxides, oxides, or salts, or mixtures thereof, with a clay-talc binder, adding sufficient moisture to render the mixture pliant, forming the pliant mixture into a shape useful in a catalytic reactor, and then heating the mixture to harden the binder and transform the metallic oxides, hydroxides, and salts to a useful catalytic form. A wide variety of catalysts may be prepared, useful in such reactions as hydrogenation, oxydehydrogenation, dehydrohalogenation, oxidation, dealkylation, disproportionation, automobile emission control, etc.

3,752,774
ZIRCONIA-SILICA-PROMOTED COBALT OXIDE CATALYST

Alvin B. Stiles, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed June 7, 1971, Ser. No. 150,790
Int. Cl. B01j *11/06*
U.S. Cl. 252—462 8 Claims

The activity of cobalt, nickel or iron oxide catalysts is improved if the catalyst contains as a promoter, 0.1–10% zirconia or 0.1–5% ceria, and the catalyst is prepared by being precipitated from a solution having a pH below 7.35. Further improvements in activity are obtained if the zirconia or ceria promoted catalyst also contains 0.08–1% of silica as a co-promoter.

3,752,775
CATALYST FOR OXIDATION AND A METHOD FOR PRODUCING THE SAME

Goro Yamaguchi, Tokyo, and Yasuo Nishikawa, Kazuhiro Yoshizaki, and Susumu Komatsu, Okayama-ken, Japan, assignors to Kyushu Taika Renga Kabushiki Kaisha, Okayama-ken, and Goro Yamaguchi, Tokyo, Japan

No Drawing. Filed Mar. 29, 1971, Ser. No. 129,178
Claims priority, application Japan, Mar. 6, 1971, 46/11,695
Int. Cl. B01j *11/06, 11/08*
U.S. Cl. 252—464 7 Claims

A catalyst for oxidation and a method for producing the same, in which said catalyst consists any one of:

(A) alkali polyaluminate,
(B) a mixture of said alkali polyaluminate and another refractory material,
(C) a mixture of said (A) as catalyst carrier or promotor and other catalytic material, or
(D) a mixture of said (B) as catalyst carrier or promotor and other catalytic material.

3,752,776
MULTIMETALITE CATALYSTS

Arthur W. Chester, Hightstown, and George T. Kerr and Howard S. Sherry, Trenton, N.J., and Albert E. Schweizer, Pasadena, Calif., assignors to Mobil Oil Corporation

No Drawing. Filed Nov. 16, 1970, Ser. No. 90,129
Int. Cl. B01j *11/06, 11/22*
U.S. Cl. 252—465 6 Claims

A new class of inorganic compounds has been prepared in which the cation is a transition metal complex and the anion is a heterpoly ion. These compounds can be represented by the general empirical formula:

$$[ML_N]_{m/n}[M'_xM''_yO_z]$$

where

M=a transition metal or a mixture of a transition metal with hydrogen
N=the number of ligands
L_N=a set of N ligands at least one of which functions as a reducing agent
m=the charge on the anion
n=the charge on the cation
M′=a transition metal or non-metal or hydrogen
M″=a metal selected from the group consisting of Group V–B and VI–B metals
x is 1 or 2
y is between 5 and 20
z is between 20 and 50

Thermal decomposition of the above compounds in an inert atmosphere results in a new series of materials referred to herein as "multimetalities" which have been found to possess unusual catalytic properties.

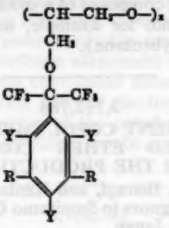
3,752,777
POLYMERS OF 2-(FLUOROPHENYL)-HEXAFLUORO-2-PROPYL GLYCIDYL ETHER

James R. Griffiths, River Heights, Md., assignor to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Apr. 9, 1971, Ser. No. 132,829
Int. Cl. C08g *23/02, 23/14*
U.S. Cl. 260—2 A 8 Claims

Polymers useful for forming hydrophobic films or coat-

ings, said polymers containing recurring units of the formula:



3,752,778

"WATER-DILUTABLE" ALKYD RESINS MODIFIED BY RADICALS OF DRYING FATTY ACIDS

Rolf Dhein, Krefeld-Bockum, Hermann Schnell, Krefeld-Urdingen, and Karl Raichle, Krefeld-Bockum, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Continuation-in-part of abandoned application Ser. No. 24,866, Apr. 1, 1970. This application Oct. 4, 1971, Ser. No. 186,518
Claims priority, application Germany, Apr. 3, 1969, P 19 17 162.1
Int. Cl. C09d 3/64, 3/72
U.S. Cl. 260—22 TN 4 Claims

The invention relates to alkyd resins modified by drying fatty acid radicals, containing urethane groups and having an acid number of from about 30 to about 70 and a hydroxyl number of from about 20 to about 120, and processes for the production thereof. Alkali, ammonia or amine salts of said alkyd resins are soluble in water and the aqueous solutions of said salts are suitable as varnishes, said varnishes and coatings obtained therefrom having advantageous properties.

3,752,779

ANTICORROSIVE HOT-DIP STRIPPABLE COATING MATERIAL AND METHOD FOR PRODUCING SAME

Mieczyslaw Maciejewski, ul. Warynskiego 6 m. 16, Warsaw, Poland

No Drawing. Continuation-in-part of abandoned application Ser. No. 613,107, Feb. 1, 1967. This application Aug. 14, 1970, Ser. No. 63,936
Claims priority, application Poland, Feb. 3, 1966, P 112,777
Int. Cl. C08d 5/20; C09d 7/02
U.S. Cl. 260—23 H 5 Claims

An anticorrosive hot-dip strippable coating material is formed by mixing a thermoplastic polymer (polypropylene) with a plasticizer therefor at an elevated temperature wherein the polypropylene comprises 2 to 30% by weight of the whole mixture.

3,752,780

HALOGENATED METHYLOL PHENOLS

Kenneth C. Petersen and Charles A. Blowers, Scotia, N.Y., assignors to Schenectady Chemicals, Incorporated, New York, N.Y.

No Drawing. Filed Apr. 26, 1971, Ser. No. 137,577
Int. Cl. C08d 9/10; C08g 37/18
U.S. Cl. 260—25 19 Claims

Dimethylol alkyl phenols and low polymers thereof having an average of 60 to 85% of the available methylol groups replaced by halomethyl are prepared. They are useful in vulcanizing various elastomers at room (ambient) temperatures. Preferably the halogen is bromine. Also preferably a zinc compound, most preferably zinc oxide, is present to speed up the vulcanization. The vulcanization of liquid rubbers is particularly effective.

3,752,781

POLYALKYLENIMINE-UREA-ALDEHYDE CATIONIC RESINS

Thaddeus M. Muzyczko, Melrose Park, and David L. York, Elgin, Ill., assignors to The Richardson Company, Melrose Park, Ill.

No Drawing. Filed Sept. 2, 1970, Ser. No. 69,146
Int. Cl. C09d 5/02; C08g 51/24
U.S. Cl. 260—29.4 R 16 Claims

A process for preparing novel water soluble polyalkylenimine-urea aldehyde resins with numerous branched tertiary amino groups which provide versatile polymers having increased stability, solubility and greater compatibility with anionic polymers. Their miscibility can be modified for greater solubility in organic solvents by reacting other aromatic nitrogen containing compounds therewith.

3,752,782

STABILIZED POLYACRYLONITRILE COMPOSITIONS AND METHOD OF FORMING SAME

Darrell R. Thompson, Somerville, N.J., and Michael W. Ensley, Charlotte, N.C., assignors to Celanese Corporation, New York, N.Y.

No Drawing. Filed Apr. 22, 1971, Ser. No. 136,622
Int. Cl. C08f 45/24
U.S. Cl. 260—29.6 AN 14 Claims

A method of forming stabilized polyacrylonitrile compositions which are particularly suited for the spinning of polyacrylonitrile fibers and films and the compositions produced thereby wherein acrylonitrile polymers containing at least 85 percent acrylonitrile are dissolved in a solvent containing an unsaturated hydrocarbon as a color stabilizer, which solvent is acetonitrile or an acetonitrile/water mixture. Preferably, the solvent and polymer are purged with nitrogen and the pH of the solvent is adjusted to about 6.0–7.0.

3,752,783

WATER- AND OIL-REPELLENT COMPOSITIONS CONTAINING FLUORO RESINS AND WATER SOLUBLE SALT OF GUANIDINE

Akitoshi Iwantani, Osaka-fu, Japan, assignor to Daikin Kogyo Kabushiki Kaisha, Osaka-shi, Japan

No Drawing. Filed July 12, 1971, Ser. No. 161,890
Claims priority, application Japan, July 14, 1970, 45/62,278; May 1, 1971, 46/29,012; May 18, 1971, 46/33,818
Int. Cl. C08f 45/24
U.S. Cl. 260—29.6 F 9 Claims

The water- and oil-repellent composition of the invention comprises an aqueous medium having dispersed therein a fluorine-containing polymer having a perfluoroalkyl side chain of 3 to 21 carbon atoms in a concentration of 0.05 to 10 weight percent, a water-soluble salt of guanidine in the range of 0.001 to 10 times the weight of said fluorine-containing polymer and an antistatic agent in the range of 0.0003 to 20 times the weight of said fluorine-containing polymer.

3,752,784

PROCESS FOR PREPARING MICROPOROUS OPEN-CELLED CELLULAR POLYMERIC STRUCTURES

Francis Edward Jenkins, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Dec. 23, 1970, Ser. No. 101,143
Int. Cl. C08f 45/30, 47/10; C08g 53/10
U.S. Cl. 260—2.5 R 24 Claims

A process for preparing microporous open-celled cellular polymeric structures which comprises (a) dissolving the starting polymer in a mixture comprising chlorofluorocarbon solvent and a cosolvent selected from methanol, ethanol, isopropanol, t-butanol, dimethylformamide, dimethylacetamide, dioxane, trioxane, dimethylsulfoxide,

tetrahydrofuran, acetone, methylethyl ketone, hexamethyl phosphoramide, acetic acid, butyrolactone, N-methylpyrrolidone, pyridine, morpholine, methyl Cellosolve, ethyl Cellosolve, propyl Cellosolve and a mixture of any of said cosolvents to form a polymer solution; (b) adding water in the amount of at least 10 volume percent of the polymer solution thereto at a temperature below the atmospheric boiling point of the solvents but greater than 0° C.; (c) separating the resultant polymerchlorofluorocarbon phase; and (d) removing the chlorofluorocarbon from the separated polymer-chlorofluorocarbon phase.

3,752,785

BLEND OF SOL AND GEL CHLOROPRENE POLYMERS

John Frederick Smith, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation of application Ser. No. 864,207, Oct. 6, 1969. This application Feb. 17, 1972, Ser. No. 227,257

Int. Cl. C08f *45/34*

U.S. Cl. 260—32.8 A **6 Claims**

A blend of chloroprene polymers particularly useful in sprayable solvent cements comprises by weight based on the total weight of blend, (a) about 10 to 50% of a sol chloroprene polymer which has a Mooney viscosity (ML 1+2.5 at 100° C.) of 20 to 80 and is prepared by polymerizing a chloroprene monomer in the presence of about 0.4 to 1.0 weight percent of sulfur, and (b) about 90 to 50% of a gel chloroprene polymer.

3,752,786

POLYURETHANE POLYUREAS

Conrad Rossitto, Andover, and David B. Taylor, Byfield, Mass., assignors to USM Corporation, Boston, Mass.

No Drawing. Filed Nov. 5, 1971, Ser. No. 196,190

Int. Cl. C08g *22/16*

U.S. Cl. 260—33.4 UR **11 Claims**

The method of making solvent soluble polyurethane polyureas by mixing a solution in a non-reactive solvent of —NCO terminated prepolymer with a solution of a diamine reactive to chain extend the prepolymer in a solvent mixture including a lower aliphatic alcohol.

3,752,787

FLUOROELASTOMER COMPOSITION CONTAINING A TRIARYLPHOSPHORANE VULCANIZATION ACCELERATOR

Marjorie Ruth de Brunner, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 128,184, Mar. 25, 1971, which is a continuation-in-part of application Ser. No. 44,884, June 9, 1970, both now abandoned. This application Jan. 28, 1972, Ser. No. 221,785

Int. Cl. C08f *15/08, 45/04*

U.S. Cl. 260—41 B **19 Claims**

A fluoroelastomer composition which has beneficial utility in the manufacture of cured fluoroelastomer articles having good resistance to compression set can be prepared by blending the following components: (A) an elastomeric copolymer of vinylidene fluoride and another fluorinated monomer; and (B) a vulcanization accelerator comprised of a triarylphosphorane compound [for example, (carbethoxyethylidene) - triphenylphosphorane], which is used either alone or in combination with a certain quaternary ammonium compound or a certain guanidine or amidine compound; and when making the cured articles, it is also preferred to add (C) a suitable metal compound such as a divalent metal oxide or hydroxide and optionally a metal salt of a weak acid; and (D) a cross-linking agent composed of a suitable polyhydroxylic-aromatic compound, for example, hexafluoroisopropylidene-bis(4-hydroxybenzene).

3,752,788

MULTICOMPONENT COPOLYMERS CONTAINING UNSATURATED ETHER COMPOUNDS AND PROCESS FOR THE PRODUCTION THEREOF

Masaaki Hirooka, Ibaragi, and Kentaro Mashita, Takatsuki, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

No Drawing. Filed Dec. 7, 1970, Ser. No. 95,985

Claims priority, application Japan, Dec. 11, 1969, 44/99,858

Int. Cl. C08f *15/40, 17/00, 19/18*

U.S. Cl. 260—47 UA **12 Claims**

A novel alternating multicomponent copolymer composed of at least one unsaturated ether compound as the group (A_1) monomer, at least one group (A_2) monomer selected from olefins, haloolefins, internal olefins and polyenes and at least one conjugated compound as the group (B) monomer and having a structure such that monomer units from groups (A_1) and (A_2) always alternate with monomer units from group (B). Said alternating copolymer is produced by contacting the monomers with an organoaluminum or organoboron halide.

3,752,789

ISOLATION OF A FLUOROPOLYMER FROM A LATEX

Ausat Ali Khan, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Aug. 20, 1971, Ser. No. 173,642

Int. Cl. C08f *1/13, 3/22, 15/06*

U.S. Cl. 260—47 UA **12 Claims**

Washed and dried fluoropolymer particles free of any harmful impurities can be prepared efficiently from a latex by a process which comprises the following steps:

(A) providing a latex of a normally solid fluoropolymer (e.g., an elastomeric copolymer of tetrafluoroethylene and a suitable ether or olefin monomer),

(B) mixing the latex with a coagulating agent (e.g., magnesium chloride) and optionally with an aliphatic alcohol,

(C) passing the resulting slurry into a first hot water bath while passing steam therein in contact with the fluoropolymer to form floating easy-to-filter fluoropolymer particles,

(D) passing the floating fluoropolymer particles into at least a second hot water bath, and

(E) removing water from the resulting floating and washed fluoropolymer particles, for example, by means of a filter and a drying oven.

3,752,790

CHLORINATED TOLUENEDIAMINE CURING AGENTS FOR USE IN PREPARING POLYURETHANE ELASTOMERS AND FOAMS

Herbert Felix McShane, Jr., and John Joseph Verbanc, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Original application Feb. 26, 1969, Ser. No. 802,686, now abandoned. Divided and this application May 19, 1971, Ser. No. 145,061

Int. Cl. C08g *22/16, 22/44*

U.S. Cl. 260—77.5 AM **4 Claims**

Amine curing agents, for liquid polyurethanes having free isocyanate end-groups, such as 3-chloro-2,6-toluene-

diamine, 3-chloro-2,4-toluenediamine, 3,5 - dichloro-2,4-toluenediamine, 3,5-dichloro-2,6-toluenediamine, 5,6-dichloro - 2,4 - toluenediamine and 5-chloro-2,4-toluenediamine and a process for curing these polyurethanes. These amines generally possess suitable reactivities for use in curing both polyurethane elastomers and foams. By the proper choice of the chlorinated toluenediamines and/or their mixtures, curing rates of the formulations and certain physical properties of the cured polyurethanes (e.g. their hardness and modulus) can be controlled over a wide range.

3,752,791

PROCESS FOR THE PRODUCTION OF POLYAMIDE IMIDES BY REACTING POLYCARBONAMIDE WITH ALIPHATIC DIISOCYANATE AND CYCLIC DICARBOXYLIC ACID ANHYDRIDE

Wilfried Zecher, Cologne, and Rudolf Merten, Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Oct. 23, 1970, Ser. No. 83,637

Claims priority, application Germany, Nov. 11, 1969, P 19 56 512.9

Int. Cl. C08g *20/38*

U.S. Cl. 260—78 SC **9 Claims**

The invention relates to a process which comprises reacting a polyamide with a polyisocyanate having at least two NCO groups, or a compound capable of reacting as such a polyisocyanate under the reaction conditions, and a cyclic dicarboxylic acid anhydride which contains at least one additional group capable of condensation or addition, or a compound capable of forming such an anhydride under the reaction conditions, at a temperature of from −20 to +450° C. Predominantly, high molecular weight reaction products, distinguished by their outstanding solubility, are obtained.

3,752,792

WITHDRAWN

3,752,793

POWDERED COATING MATERIALS

Dieter Arlt, Cologne, Hans-Herwig Bertram, Leichlingen, Josef Pedain, Cologne, and Erich Zankl, deceased, by Helga Zankl and Walter Zankl, Cologne, Germany, and Angelika Zankl de Ramis, Palma de Mallorca, Spain, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Oct. 22, 1971, Ser. No. 191,843

Claims priority, application Germany, Sept. 7, 1971, P 21 44 643.5

Int. Cl. C08f *27/08, 45/72*

U.S. Cl. 260—78.5 T **5 Claims**

Powdered coating agent for use in the electrostatic sprayed powder process consisting of mixtures of

(A) copolymers
(B) bis- or tris-oxazolines and optionally
(C) auxiliary agents such as pigments and flowing agents.

The copolymer contains polymerised units of

25–60% styrene or derivatives thereof or (meth)acrylonitrile;
30–65% by weight of acrylic or methacrylic esters and
5–20% by weight of α,β-unsaturated carboxylic acids.

5 to 25 parts by weight of bis- or trisoxazolines are employed for 95 to 75 parts by weight of copolymer.

3,752,794

NITROGEN-CONTAINING p-TERT-BUTYLSTYRENE COPOLYMERS

Robert Bacskai, Kensington, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Original application Dec. 18, 1969, Ser. No. 886,383. Divided and this application Jan. 12, 1972, Ser. No. 217,237

Int. Cl. C08f *15/04*

U.S. Cl. 260—88.1 PA **5 Claims**

High molecular weight nitrogen-containing copolymers of p-tert-butylstyrene and lubricating oil containing them.

3,752,795

POLYMERIZATION OF OLEFINS WITH A CHROMYL BIS(TRIORGANOTITANATE) CATALYST

David E. Boone, Downers Grove, Ill., assignor to Standard Oil Company, Chicago, Ill.

No Drawing. Filed Mar. 24, 1972, Ser. No. 237,922

Int. Cl. C08f *1/42, 3/06*

U.S. Cl. 260—88.2 R **10 Claims**

Chromyl bis(triorganotitanates) and related compositions are prepared from a chromium oxide and an organotitanium compound and, when combined with an organoaluminum compound, are useful for the polymerization of olefins.

3,752,796

NOVEL POLYTETRAFLUOROETHYLENE PREPARED IN THE PRESENCE OF A FLUOROALKANOIC ACID SALT DISPERSING AGENT AND OCTAFLUOROCYCLOBUTANE

Max B. Mueller, Morristown, Peter P. Salatiello, Morris Plains, and Dulari L. Sawhney, Highland Park, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Nov. 19, 1970, Ser. No. 91,046

Int. Cl. C08f *3/24*

U.S. Cl. 260—92.1 **8 Claims**

Particulate polytetrafluoroethylene dispersion resin characterized by high molecular weight, relatively large particle size, uniform spherical particle shape and narrow particle size distribution, which is suitable for making stable concentrated aqueous polytetrafluoroethylene dispersions of concentrations higher than heretofore available, is made by polymerization of tetrafluoroethylene in aqueous dispersion in the conjoint presence of liquid octafluorocyclobutane and certain polyfluorinated carboxylic acid salt dispersing agents, using water-soluble peroxide initiators.

3,752,797

MIXED CATALYST FOR THE POLYMERIZATION OF α-OLEFINS

Wolfgang Gordon, Hofheim, Taunus, Kurt Rust, Frankfurt am Main, and Erwin Schrott, Sulzbach, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Nov. 5, 1971, Ser. No. 196,196

Claims priority, application Germany, Nov. 7, 1970, P 20 54 950.2

Int. Cl. C08f *3/10, 1/44, 1/56*

U.S. Cl. 260—93.7 **13 Claims**

Process for the polymerization of α-olefins by means of a mixed catalyst composed of a phosphoric acid-N-

alkylamide, a cyclopolyalkene, a halogen compound of trivalent titanium and a halogen-free organo-aluminium compound. Products of improved stereospecificity are obtained with a good catalyst-time-yield.

3,752,798

TRIS-N^{A_1},N^{B_1},$N^{C_{B_2}}$ - (3-X-3-OXO - 1-Y-PROP-1-EN-1-YL)[N$^{\delta}$-(4-Z-6-R-PYRIMIDIN - 2 - YL) ORNITHINE B_{22}]-INSULINS AND THEIR PREPARATION

Gaston Amird, 27 Rue du Marechal Joffre, 77 Thorigny, France, and Truong van Thuong, 1 Allee la Bruyere, Domaine de la Lorette, 93 Clichy-sous-Bois, France

No Drawing. Filed Dec. 2, 1969, Ser. No. 881,602

Int. Cl. C07c *103/52*

U.S. Cl. 260—112.7 **9 Claims**

Tris - N^{A_1},N^{B_1},$N^{C_{B_2}}$ - (3 - X - 3 - oxo - 1 - Y - prop-1 - en - 1 - yl)[N$^{\delta}$ - (4-Z-6-R-pyrimidin-2-yl) ornithine B_{22}]-insulins and their water soluble alkali metal salts existing in substantially dissociated state having delayed action hypoglycemiant and their preparation.

3,752,799

N$^{\alpha}$-ACETYL-2-O-METHYLTYROSINE-OXYTOCIN

Karel Jost, Vladimir Pliska, Ivan Krejci, and Frantisek Sorm, Prague, Czechoslovakia, assignors to Ceskoslovenska Akademie Ved, Prague, Czechoslovakia

No Drawing. Filed May 20, 1970, Ser. No. 39,169

Claims priority, application Czechoslovakia, June 4, 1969, 3,973/69

Int. Cl. C07c *103/52;* **C07g** *7/00;* **C08h** *1/00*

U.S. Cl. 260—112.5 **1 Claim**

N$^{\alpha}$-acetyl-2-O-methyltyrosine-oxytocin having uterine contraction inhibitory activity and process of preparing the same by reaction of 2-O-methyltyrosine-oxytocin with an ester of acetic acid.

3,752,800

PROCESS FOR THE MANUFACTURE OF A PYROGLUTAMYLPEPTIDE

Hans Wissmann, Bad Soden, Taunus, Wolfgang Konig, Langenhain, Taunus, and Rolf Geiger, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed July 6, 1971, Ser. No. 160,211

Claims priority, application Germany, July 7, 1970, P 20 33 600.9

Int. Cl. C07c *103/52;* **C07g** *7/00;* **C08h** *1/00*

U.S. Cl. 260—112.5 **1 Claim**

Methods of making L-pyroglutamyl-L-histidyl-L-proline-amide, useful in the treatment of hypothyreosis:

(1) by reacting an N$^{\alpha}$,N$^{\gamma}$-protected glutamine with L-histidyl - L - proline-4,4'-dimethoxybenzhydrylamide; or

(2) by reacting an N$^{\alpha}$-protected-N$^{\gamma}$-4,4'-dimethoxybenzhydryl-L-glutamyl - L - histidine with L-proline amide or L-proline-4,4'-dimethoxybenzhydrylamide.

Protective groups are removed and the reaction product is cyclized by treatment with trifluoroacetic acid after catalytic hydrogenation of any benzyloxycarbonyl protective groups present.

3,752,801

FIBER-REACTIVE PHTHALOCYANINE-SULFONAMIDO AZO-PYRIDONE DYESTUFFS

Gerd Hoelzle, Liestal, and Alfred Fasciati, Bottmingen, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

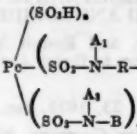
No Drawing. Filed June 4, 1970, Ser. No. 43,605

Claims priority, application Switzerland, June 12, 1969, 8,983/69, June 12, 1969, 18,644/69; Apr. 20, 1970, 5,874/70

Int. Cl. C09b *29/36, 62/02, 62/08*

U.S. Cl. 260—146 T **15 Claims**

Phthalocyaninesulfonamido azo-pyridone dyestuffs of the general formula



in which

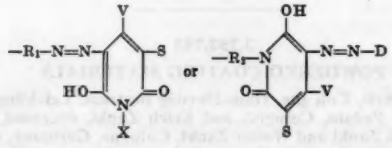
Pc is nickel or copper phthalocyanine

A_1, A_2 and A_3 each independently is hydrogen, lower alkyl or hydroxyethyl

R is phenylene, methylenephenylene, ethylenephenylene or diphenylene, each of which is unsubstituted or substituted in the phenylene moiety by one or more of chloro, C_1–C_2 alkoxy, C_1–C_2 alkyl or sulfonic acid, or alkylene or cycloalkylene of 2 to 6 carbon atoms, each of which is unsubstituted or substituted by β-hydroxyethyl, acetyl or carbamyl, ethylenepiperazinylene or R together with A_1 and A_2 forms piperazinylene or piperidnylene,

Z is a fibre-reactive group capable of reacting with the hydroxyl groups of cellulose to form a covalent bond

B is a group of the formula



in which

R_1 is phenylene, methylenephenylene or ethylenephenylene where the phenylene moiety is substituted by one or more of chloro, C_1–C_2 alkoxy, C_1–C_2 alkyl or sulfonic acid and wherein the phenyl moiety is bound to the azo group

V is lower alkyl, phenyl, tolyl, carboxylic acid ethyl ester, carboxylic acid benzyl ester, methylene carboxylic acid ethyl ester, carbamyl, N-ethyl carbamyl, or β-cyanoethylene

S is nitrile, carboxylic acid ethyl ester, carbamyl, N,N-dimethylsulfamyl, methylsulfonyl or phenylsulfonyl

X is hydrogen, lower alkyl which is unsubstituted or substituted by amino, hydroxyl, sulfonic acid or β-hydroxyethyleneamine, phenyl, benzyl, cyclohexyl, each of which can be substituted by amino, or X is a group of the formula

where

R' is alkylene of 1 to 6 carbon atoms, cyclohexylene, phenylene or methylenephenylene

A_4 is hydrogen or lower alkyl, and

Z is a fiber-reactive group

R_2 is C_1–C_8 alkylene

D is benzenesulfonate containing one or more sulfonic acid groups and substituted by one or more of chloro, hydroxy, methoxy, methyl, carboxy, acetamido, benzamido, nitro, sulphoacetylamino, trifluoromethyl or aminobenzoyl, or naphthalenesulfonate containing one or more sulfonic acid groups and D can additionally be substituted by a fibre-reactive group, and

a, *b* and *c* each, independently is an integer or fractional number provided that *b* and *c* is each at least 1.0 and the sum of $a+b+c$ is an integer or fractional number between 3.0 and 4.0,

are useful as cotton dyes yielding green shades of good general fastness properties.

3,752,802

MONO-AZO COMPOUNDS CONTAINING AN ACYLATING FUNCTION

Chester Stephen Sheppard, Tonawanda, and Ronald Edward MacLeay, Williamsville, N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

No Drawing. Continuation-in-part of application Ser. No. 667,352, Sept. 3, 1967. This application May 14, 1970, Ser. No. 37,311

Int. Cl. C07c *107/00, 107/02, 107/04*

U.S. Cl. 260—192 **13 Claims**

(A) A class of azo compounds R—N=N—R_1 where R and/or R_1 are groups containing an acylating function, e.g., acyl chloride, chloroformate or anhydride. Example: Cis-4,4'-azobis-(4-cyanovalery chloride).

(B) A class of azo containing polymers

$$(R'\text{—}N{=}N\text{—}C(R_2)(R_3')\text{—}R_3''\text{—}Y)_m\text{—}D\text{—}Z$$

where R' is t-aliphatic, formed by reacting a polymer having at least one group reactive with an acyl group and a compound as in "A" containing only one acylating function. Example: the reaction product of 4-t-butylazo-4-cyanovaleryl chloride and hydroxyl terminated polybutadiene liquid resin.

(C) A class of azo containing polymers

$$Z(E\text{—}Y\text{—}R_3''\text{—}C(R_2)(R_3')\text{—}N{=}N\text{—}C(R_2)(R_3')\text{—}R_3''\text{—}Y)_m\text{—}E\text{—}Z$$

formed by the reaction of a compound as in "A" having two acylating functions with (1) a monomer having two acyl-reactive groups and a monomer having two acylating functions, or (2) a polymer having at least one acyl-reactive group.

(D) Polymers B and C are useful in the production of block and graft polymers and in curing unsaturated polyester resin-vinyl monomer systems. Polymer C forms block and graft polymers with vinyl monomers with substantially no formation of homopolymers. These block and graft polymers are compatibilizing agents for solutions of homopolymers.

3,752,803

DERIVATIVES OF 3 - (3'β-TRIDIGITOXOSYL-14'β-HYDROXY-5'β-ANDROSTAN - 17'β-YL)-ACRYLIC ACID

Wolfgang Eberlein, Biberach, Riss, and Joachim Heider, Warthausen-Oberhofen, Germany, Walter Kobinger, Vienna, Austria, and Willi Diederen, Biberach, Riss, Germany, assignors to Boehringer Ingelheim G.m.b.H., Ingelheim am Rhein, Germany

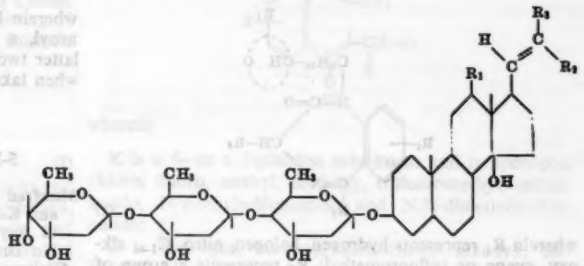
No Drawing. Filed Oct. 18, 1971, Ser. No. 190,279

Claims priority, application Germany, Oct. 27, 1970, P 20 52 634.5

Int. Cl. C07c *173/00*

U.S. Cl. 260—210.5 **6 Claims**

Compounds of the formula



wherein

R_1 is hydrogen or hydroxyl,

R_2 is hydrogen, chlorine, fluorine, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or cyano, and

R_3 is cyano, carboxyl, carbalkoxy, carbaryloxy or carbaralkoxy.

the compounds are useful as cardiotonics with positive inotropic action.

3,752,804

2-ALLYLOXYINOSINE-5'-PHOSPHATE AND PHYSIOLOGICALLY ACCEPTABLE SALTS THEREOF

Kin-Ichi Imai, Yoshio Yoshioka, Jun Toda, and Hisashi Aoki, Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

No Drawing. Filed June 10, 1970, Ser. No. 45,223

Claims priority, application Japan, June 14, 1969, 44/47,139; June 21, 1969, 44/49,179

Int. Cl. C07d *51/54*

U.S. Cl. 260—211.5 R **5 Claims**

A 2-allyloxyinosine-5'-phosphate and a physiologically acceptable salt thereof have excellent ability for improving and/or enhancing the flavor of foods and beverages. Moreover, there is a significant synergistic action between these compounds and monosodium glutamate. Also provided are novel starting materials for preparing these compounds.

3,752,805

2-LOWERALKYLTHIOADENOSINES

Mary H. Maguire, Roland H. Thorp, and Denis M. Nobbs, Sydney, New South Wales, Australia, assignors to The University of Sydney, Sydney, New South Wales, Australia

No Drawing. Filed June 4, 1970, Ser. No. 43,570

Claims priority, application Australia, June 5, 1969, 56,064/69

Int. Cl. C07d *51/54*

U.S. Cl. 260—211.5 R **4 Claims**

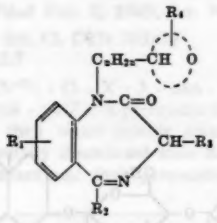
2-loweralkylthioadenosines and pharmaceutical compositions and methods for producing coronary vasodilatation and hypotensive activity with these compounds.

3,752,806
BENZODIAZEPINES

Hisao Yamamoto, Nishinomiya, Shigeho Inaba, Takarazuka, Toshiyuki Hirohashi, Ashiya, Michihiro Yamamoto, Toyonaka, Kikuo Ishizumi and Mitsuhiro Akatsu, Ikeda, Isamu Maruyama, Minoo, Yoshiharu Kume, Takarazuka, Kazuo Mori, Kobe, and Takahiro Izumi, Takarazuka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

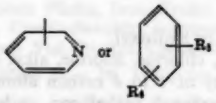
No Drawing. Filed Aug. 16, 1971, Ser. No. 172,298
Claims priority, application Japan, Aug. 24, 1970, 45/74,410
Int. Cl. C07d *53/06*
U.S. Cl. 260—239.3 D 6 Claims

Novel benzodiazepines represented by the formula,

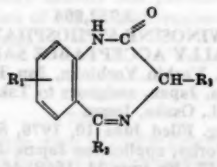


(I)

wherein R_1 represents hydrogen, halogen, nitro, C_{1-4} alkoxy, cyano or trifluoromethyl; R_2 represents a group of the formula,

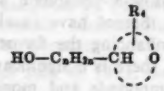


(wherein R_5 and R_6 represent hydrogen, halogen, trifluoromethyl, cyano or C_{1-4} alkyl); R_3 and R_4 represent hydrogen or C_{1-4} alkyl; and n represents an integer of 1 to 4 are prepared by reacting a 1-unsubstituted benzodiazepine represented by the formula,



(II)

wherein R_1, R_2 and R_3 are as defined above, with a reactive ester of alcohol represented by the formula



(III)

wherein R_4 is as defined above.

The benzodiazepine derivatives of the Formula I have valuable pharmacological properties, in particular excellent tranquilizing, sedative, muscle relaxant, anticonvulsant and hexobarbital potentiating activities.

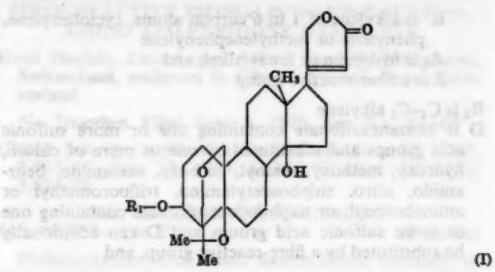
3,752,807
PROCESS FOR THE PREPARATION OF NOVEL ORALLY EFFECTIVE CARDIO-ACTIVE CARDENOLIDES

Johannes Hermann Hartenstein, Wittental, and Gerhard Satzinger, Gundelfingen, Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

No Drawing. Filed Feb. 9, 1972, Ser. No. 224,960
Claims priority, application Germany, Feb. 11, 1971, P 21 06 386.5
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.57 12 Claims

The present application relates to compounds of the

General Formula I



(I)

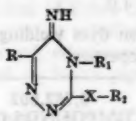
wherein R_1 means hydrogen, an alkyl, alkoxyalkyl, acyl, aroyl, a tetrahydropyranosyl, or a glycosyl residue, the latter two being substituted if desired. These compounds when taken orally produce a cardiotonic effect.

3,752,808
5-IMINO-1,2,4-TRIAZINES AND THEIR PRODUCTION

Manfred Jautelat and Hans-Joachim Kabbe, Leverkusen, and Kurt Ley, Odenthal-Globusch, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Jan. 19, 1971, Ser. No. 107,823
Claims priority, application Germany, Jan. 24, 1970, P 20 03 144.1
Int. Cl. C07d *55/18*
U.S. Cl. 260—249.5 18 Claims

Novel 5-imino-1,2,4-triazine compounds of the formula



in which

R is an aliphatic, arylaliphatic, aromatic or heterocyclic radical which may be substituted by hydroxy, halogen, alkyl and/or nitro,

R_1 is an aliphatic hydrocarbon radical, amino, alkylamino or dialkylamino,

R_2 is hydrogen or an aliphatic hydrocarbon radical, and

X is oxygen, sulfur or NR_3 where R_3 is for hydrogen or an aliphatic hydrocarbon radical,

possess outstanding herbicidal, especially selective herbicidal activity, and furthermore are intermediates for the preparation of other herbicidal compounds.

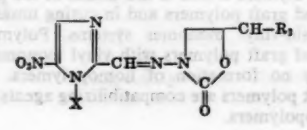
The invention also provides a novel process for making the novel 5-imino-1,2,4-triazine compounds by reacting a corresponding α-iminonitrile with a hydrazine derivative.

3,752,809
3-(5-NITRO-2-IMIDAZOLYL-METHYLENAMINO)-2-OXAZOLIDINONES

Clemens Rufer, Eberhard Schroder, and Hans-Joachim Kessler, Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

No Drawing. Filed Apr. 16, 1970, Ser. No. 29,236
Claims priority, application Germany, Apr. 17, 1969, P 19 20 150.4
Int. Cl. C07d *85/28*
U.S. Cl. 260—240 A 34 Claims

3 - (5 - nitro - 2 - imidazolyl - methylenamino) - 2-oxazolidinones of the formula



wherein X is substituted or unsubstituted hydrocarbon and R is hydrocarbon-thiol or -thione or a tertiary amino group, are antimicrobials, especially against *Trichomonas vaginalis*.

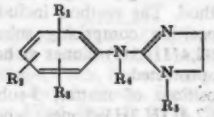
3,752,810

SUBSTITUTED N-AMINOALKYL-ARYLAMINO-IMIDAZOLINES-(2)

Helmut Stähle, Herbert Köppe, Werner Kummer, and Hans-Wolfgang Samtleben, Ingelheim am Rhein, Germany, assignors to Boehringer Ingelheim G.m.b.H., Ingelheim am Rhein, Germany

No Drawing. Filed Nov. 16, 1970, Ser. No. 90,036
Claims priority, application Germany, Nov. 17, 1969, P 19 57 722.1
Int. Cl. C07d *87/38, 87/40*
U.S. Cl. 260—247.5 R **10 Claims**

Novel compounds selected from the group consisting of N-aminoalkyl-arylamino-imidazolines-(2) of the formula



(I)

wherein R_1, R_2 and R_3 may be the same or different and are selected from the group consisting of hydrogen, fluorine, chlorine, bromine, trifluoromethyl, cyano and lower alkyl and lower alkoxy of 1 to 7 carbon atoms and one of R_4 and R_5 being hydrogen with the other being $-(CH_2)_n-A$, n is 2 or 3 and A is selected from the group consisting of dialkylamino with 1 to 4 carbon atoms in each alkyl, morpholino, pyrrolidino and piperidino and their non-toxic, pharmaceutically acceptable acid addition salts having hypotensive activity, their preparation and their use.

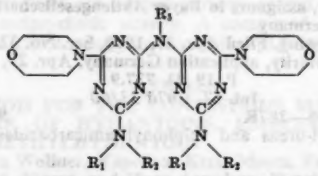
3,752,811

NOVEL N,N-BIS-(BIS-AMINO-s-TRIAZINYL)-ALKYLAMINES

Denis Varsanyi, Arlesheim, Basel-Land, and Willy Roth, Strengelbach, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Application Oct. 4, 1967, Ser. No. 672,701, now Patent No. 3,594,374, dated July 20, 1971, which is a continuation-in-part of abandoned application Ser. No. 560,855, June 27, 1966. Divided and this application Mar. 4, 1971, Ser. No. 121,139
Claims priority, application Switzerland, June 30, 1965, 9,158/65
Int. Cl. C07d *87/40*
U.S. Cl. 260—246 B **2 Claims**

New N,N-bis-(bis-amino-s-triazinyl)-alkylamines of the formula



in which each of R_1 and R_5 represents alkyl or from 1 to 5 carbon atoms, and R_2 represents alkyl or from 10 to 18 carbon atoms, are useful as surface treating agents. Compositions containing these compounds are particularly useful as texitle softeners.

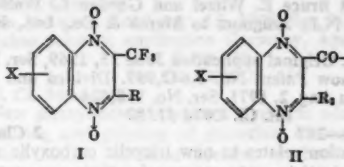
3,752,812

2-TRIFLUOROMETHYLQUINOXALINE-DI-N-OXIDES

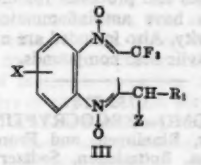
Elie Abushanab, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

No Drawing. Filed Feb. 5, 1970, Ser. No. 9,041
Int. Cl. C07d *51/78*
U.S. Cl. 260—250 R **14 Claims**

Novel 2 - trifluoromethyl - 3 - substitutedquinoxaline-di - N - oxides and 2 - trifluoroacetyl - 3 - substituted-quinoxaline - di - oxides having the formulae



I II



III

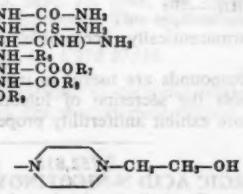
wherein

X is a 6- or a 7-position substituent and is hydrogen, chloro, fluoro, methyl, methoxy, trifluoromethyl, sulfonamido, N-methylsulfonamido and N,N-dimethylsulfonamido;

Z is hydrogen, carboxy, carbo(lower alkoxy), carbamyl, chloro, fluoro, bromo, (lower alkyl)thio, (lower alkyl)sulfinyl, (lower alkyl)sulfonyl, hydroxy, lower alkoxy, lower alkanoyloxy, amino, mono(lower alkyl)-amino, di(lower alkyl)amino, trimethylammonium and nitro-oxy;

R_1 is hydrogen and lower alkyl;

R is hydrogen, carbo(lower alkoxy), carbamyl, chloro, bromo, fluoro, cyano, lower alkoxy, (lower alkyl)thio, (lower alkyl)sulfinyl, (lower alkyl)sulfonyl, amino, mono (lower alkyl)amino, di(lower alkyl)amino, ω,ω,ω-trifluoro(lower alkyl), trifluoroacetyl, phenyl, cycloalkyl, di(lower alkyl)aminoethyl, $-CO-R_2$, formyl and $-CH=N-R_3$ wherein R_3 is



wherein

R_6 is lower alkyl, benzyl and hydroxy alkyl containing from 2 to 4 carbon atoms;

R_7 is lower alkyl and hydroxy alkyl containing from 2 to 4 carbon atoms;

R_8 is lower alkyl and phenyl; and

R_9 is hydrogen and lower alkyl; and

R_2 is lower alkyl, phenyl, 2-furyl, 2-pyrryl, 2-thienyl, 2,5-dimethyl-3-thienyl and 5-substituted-2-thienyl wherein the substituent is methyl, chloro, bromo and iodo;

The non-toxic acid addition salts of those compounds wherein Z and R are amino, mono(lower alkyl)amino and di(lower alkyl)amino; and the sodium and potassium salts of those compounds wherein Z is carboxy; and methods for their preparation are described. The compounds are useful as antibacterial agents. Many of them are also useful as animal growth promotants.

3,752,813

ORTHO-HYDROXY-DIHYDRO-PHENOZINE-CARBOXYLIC ACIDS AND DERIVATIVES

Tsung-Ying Shen, Westfield, Richard Greenwald, Fanwood, and Bruce E. Witzel and Gordon L. Walford, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Original application June 25, 1969, Ser. No. 836,583, now Patent No. 3,642,997. Divided and this application Aug. 2, 1971, Ser. No. 168,424

Int. Cl. C07d *51/80*

U.S. Cl. 260—267 2 Claims

This invention relates to new tricyclic carboxylic acid and ester derivatives and processes for their preparation. These compounds have anti-inflammatory, anti-pyretic and analgesic activity. Also included are methods for preparing said carboxylic acid compounds.

3,752,814

2-BROMO-α-ERGOCRYPTINE

Edward Fluckiger, Binningen, and Franz Troxler and Albert Hofmann, Bottmingen, Switzerland, assignors to Sandoz Ltd. (also known as Sandoz AG), Basel, Switzerland

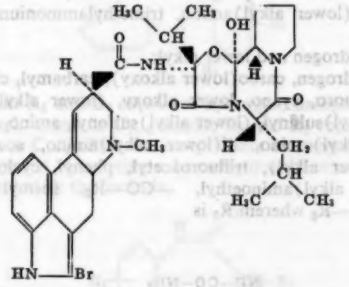
No Drawing. Continuation-in-part of application Ser. No. 827,144, May 23, 1969. This application Sept. 9, 1971, Ser. No. 179,169

Claims priority, application Switzerland, May 31, 1968, 8,168/68

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 PE 2 Claims

The invention concerns 2-bromo-α-ergocryptine of the formula



and pharmaceutically acceptable acid addition salts thereof.

The compounds are useful in inhibiting lactation, i.e. they inhibit the secretion of luteotropic hormone and furthermore exhibit antifertility properties.

3,752,815

LYSERGIC ACID N-NICOTINOYL PIPERAZIDE

Peter Stutz, Basel, Switzerland, assignor to Sandoz Ltd. (also known as Sandoz AG), Basel, Switzerland

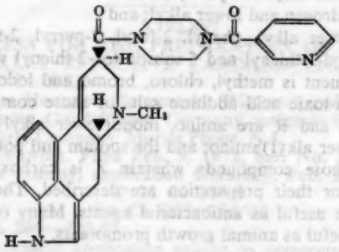
No Drawing. Filed Sept. 4, 1970, Ser. No. 69,930

Claims priority, application Switzerland, Sept. 10, 1969, 13,651/69, 13,652/69

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 PE 1 Claim

The present invention concerns the novel heterocyclic compound of the formula:



and pharmaceutically acceptable acid addition salts thereof.

The compounds are useful in the treatment of conditions of orthostasis and hypertonia, and are also salidiuretics, anti-phlogistics and edema-inhibitors.

3,752,816

CERTAIN 3-SUBSTITUTED-PYRIDO[3,2-d] PYRIMIDINE 2,4-(1H,3H)-DIONES

Anson R. Cooke, Hatboro, Pa., and Richard L. Jacobs, Perrysburg, and Eli Dee Compton, Toledo, Ohio, assignors to The Sherwin-Williams Company

No Drawing. Continuation-in-part of abandoned applications Ser. No. 740,089 and Ser. No. 740,047, both June 26, 1968. This application June 10, 1969, Ser. No. 832,026

Int. Cl. C07d *57/20*

U.S. Cl. 260—256.4 F 12 Claims

A method for controlling plant growth and compounds used in such method. The method includes the step of applying a composition comprising substituted pyrido [3,2-d]pyrimidine-2,4(1H,3H)-diones as herein described to the locus to be protected.

As new compositions of matter, 3-substituted-pyrido [3,2-d]pyrimidine-2,4(1H,3H)-diones, where the 3-substituent is a member of the group consisting of alkyl groups having from 2 to 8 carbon atoms, dimethoxyethyl, aralkyl groups such as benzyl, chlorosubstituted benzyl, and lower alkyl and methoxy substituted benzyl, cycloalkyl groups having from 3 to 8 carbon atoms, pyridyl substituted alkyl groups having from 1 to 2 carbon atoms, alkenyl groups having not more than 8 carbon atoms, tetrahydrofurfuryl, aryl, pyrrolidino, piperidino, homopiperidino, and septamethyleneimino, and 1,3-disubstituted analogues.

3,752,817

2,9-DICARBOXYQUINACRIDONE AND METHODS FOR ITS PRODUCTION

Felix Frederick Ehrich, Mexico City, Mexico, and Edward E. Jaffe, Union, N.J., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed May 6, 1971, Ser. No. 140,984

Int. Cl. C07c *39/00*

U.S. Cl. 260—279 R 6 Claims

This invention relates to 2,9-dicarboxyquinacridone and to methods for its preparation.

3,752,818

SULPHONYL-UREAS AND SULPHONYL-SEMICARBAZIDES CONTAINING HETEROCYCLIC ACYL AMINO GROUPS AND THEIR PRODUCTION

Hans Plumpe and Walter Puls, Wuppertal-Elberfeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

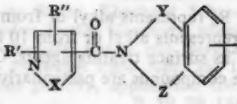
No Drawing. Filed Apr. 27, 1970, Ser. No. 32,465

Claims priority, application Germany, Apr. 29, 1969, P 19 21 737.9

Int. Cl. C07d *33/60*

U.S. Cl. 260—287R 9 Claims

Sulphonyl-ureas and sulphonyl-semicarbazides of the formula:



wherein

R is straight or branched chain saturated or unsaturated aliphatic of up to 10 carbon atoms, mono- or polycyclic cycloaliphatic and the corresponding ring systems wherein the carbon atom in the ring system of R at the point of linkage to the adjacent NH-group is replaced by a nitrogen atom, cycloalkylalkyl substituted by lower alkyl or polycycloalkylalkyl substituted by lower alkyl,

R' and R" are hydrogen, halogen, alkyl, phenyl, mono- or di-halophenyl or lower alkoxyphenyl, or R' and R" are alkyl linked together;

X is oxygen, sulphur, nitrogen or nitrogen whose hydrogen atom is replaced by alkyl, aryl, aralkyl or by alkyl, aryl or aralkyl substituted by halogen, alkyl, alkoxy or trifluoromethyl, and

Y and Z are unsubstituted or alkyl-substituted alkylene of 1 to 3 carbon atoms, or if Y or Z is at least 2 carbon atoms, the other one may be a direct bond, and pharmaceutically acceptable non-toxic salts thereof, exhibit blood sugar depressant properties and are thus useful agents in the treatment of diabetes. These compounds may be produced by the reaction of amino compounds with sulphonamide derivatives or arylsulphonyl isocyanates or by reacting sulphonamides with amine derivatives or isocyanate derivatives.

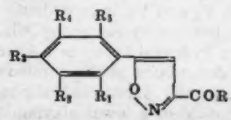
3,752,819

5-PHENYL-ISOXAZOLE-3-CARBOXYLIC ACIDS AND THEIR DERIVATIVES

Jean B. Philippe, Paris, France, assignor to Ferlux, Puy-de-Dome, France

No Drawing. Filed Dec. 2, 1970, Ser. No. 94,527
Claims priority, application France, Dec. 23, 1969, 6944556
Int. Cl. C07d *31/36*
U.S. Cl. 260—295 R **4 Claims**

New derivatives of 5-phenyl-isoxazole-3-carboxylic acid of the general formula



(I)

in which R represents a free or esterified hydroxylated group, an aminated group or hydrazine group.

These derivatives are prepared by the action of hydroxlamine or benzoylpyruvic acids.

Therapeutical application of the derivatives of the invention particularly as salidiuretics, sedatives, analgesics.

3,752,820

SUBSTITUTED-1,2,3,4-TETRAHYDROBENZO-THIENO[3,2-c]PYRIDINE DERIVATIVES

John T. Suh, Mequon, Wis., assignor to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Filed Mar. 20, 1972, Ser. No. 236,228
Int. Cl. C07d *31/50*
U.S. Cl. 260—294.8 B **6 Claims**

Substituted - 1,2,3,4 - tetrahydrobenzothieno[3,2-c]pyridine derivatives are central nervous system depressants having antipsychotic activity. A compound disclosed is 8-chloro-1,2,3,4-tetrahydrobenzothieno[3,2-c]pyridine.

3,752,821

METHOD FOR THE CONTINUOUS MANUFACTURE OF HYDANTOINS, ESPECIALLY 5,5-DIMETHYLHYDANTOIN

Johannes Wollner, Kapellen, Kreis Moers, Peter Francis Pascoe, Moers, and Hans Arendsen, Homberg (Lower Rhine), Germany, assignors to Rheinpreussen AG, Homberg, Germany

Continuation of abandoned application Ser. No. 752,643, Aug. 14, 1968. This application June 1, 1971, Ser. No. 149,069
Claims priority, application Germany, Aug. 18, 1967, P 16 95 646.0
Int. Cl. C07d *49/32*
U.S. Cl. 260—309.5 **4 Claims**

Improved process for continuously manufacturing hydantoins by the reaction of aldehydes or ketones with hydrocyanic acid or cyanides with ammonia or ammonium compounds and carbon dioxide or bicarbonates wherein the reaction is carried out countercurrently in a packed column.

3,752,822

CARBAZOLE DYESTUFFS

Roderich Raue and Hans-Peter Kuhlthau, Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Apr. 15, 1968, Ser. No. 721,177
Claims priority, application Germany, Apr. 24, 1967, F 52,230
Int. Cl. C07d *27/68*
U.S. Cl. 260—315 **2 Claims**

New phenyl-heteryl-methane dyestuffs adapted for use in dyeing and printing of materials of leather, tannin-treated cotton, cellulose acetate, synthetic super polyamides and polyurethanes and for the dyeing of fibers containing lignin such as coco, jute and sisal or for the production of writing liquids, stamp dyes, paste for ball-point pens or for use in offset printing, or for dyeing and printing of materials consisting completely or partially of polymers or copolymers of acrylonitrile or vinylidene cyanide or acid-modified polyester materials and are characterized on these latter materials by good fastness to light, wet processing, rubbing and sublimation, as well as having good affinity to the fibers and good fastness to cross-dyeing.

3,752,823

N-ALKYL-TETRAHYDROCARBAZOLES

James M. McManus, Old Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

No Drawing. Continuation of abandoned application Ser. No. 853,933, Aug. 28, 1969. This application Apr. 2, 1971, Ser. No. 130,824
Int. Cl. C07d *27/68*
U.S. Cl. 260—315 **3 Claims**

N-alkyl-tetrahydrocarbazoles such as N-alkyl-4-amino-alkyl-1,2,3,4-tetrahydrocarbazoles are useful as hypoglycemic agents.

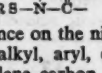
3,752,824

THIOAMIDES

Aubert Yaucher Coran, Creve Coeur, Mo., and Joseph Edward Kerwood, St. Albans, W. Va., assignors to Monsanto Company, St. Louis, Mo.

No. Drawing. Division of application Ser. No. 714,445, Mar. 20, 1968, now Patent No. 3,546,185, and a continuation-in-part of applications Ser. Nos. 549,730, May 12, 1966, 579,493, Sept. 15, 1966, and 459,466, May 27, 1965, all now abandoned. This application Mar. 27 1970, Ser. No. 29,717
Int. Cl. C07d *27/30*
U.S. Cl. 260—326 S **16 Claims**

Sulfenamides characterized by carbonyl adjacent to the sulfenamide nitrogen, the characteristic nucleus of which is



where the dangling valence on the nitrogen may be linked to a second carbonyl, alkyl, aryl, cycloalkyl, hydrogen, alkylene carbon, or arylene carbon, and R is alkyl, aryl, or cycloalkyl. The compounds, many of which are new, inhibit premature vulcanization of vulcanizable elastomers and stabilize styrene-butadiene rubber.

3,752,825

PHENYL-HETERYL-METHANE DYESTUFFS

Roderich Raue and Hans-Peter Kuhlthau, Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Original application Apr. 15, 1968, Ser. No. 721,177. Divided and this application Sept. 25, 1970, Ser. No. 75,768
Claims priority, application Germany, Apr. 24, 1967, F 52,230
Int. Cl. C07d *27/38*
U.S. Cl. 260—326.11 **3 Claims**

This invention relates to phenyl-heteryl-methane dyestuffs having an indole nucleus, and the preparation thereof.

3,752,826

AROYL-SUBSTITUTED PYRROLES

John Robert Carson, Norristown, Pa., assignor to McNeil Laboratories, Inc.

No Drawing. Continuation-in-part of application Ser. No. 741,348, July 1, 1968, which is a continuation-in-part of application Ser. No. 656,074, July 26, 1967. This application Jan. 26, 1970, Ser. No. 5,958
Int. Cl. C07d *27/26*
U.S. Cl. 260—326.3 41 Claims

The compounds are of the class of 5-aroyl-pyrrole alkanoic acids and corresponding acid derivatives thereof useful as anti-inflammatory agents and as synthetic intermediates.

3,752,827

DIELS-ALDER ADDUCTS OF BIS(TRIFLUOROMETHYL)THIOKETENE

Maynard Stanley Raasch, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of abandoned application Ser. No. 31,392, Apr. 23, 1970. This application Mar. 16, 1971, Ser. No. 124,989
Int. Cl. C07d *65/04*
U.S. Cl. 260—327 TH 10 Claims

Diels-Alder reaction of bis(trifluoromethyl)thioketene with conjugated cyclic dienes results in hexafluoroisopropylidenedihydrothiopyrans. These compounds, and certain derivatives thereof, have anti-inflammatory properties.

3,752,828

STABILIZATION OF LACTONE COMPOUNDS

Donald C. Best, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Dec. 7, 1970, Ser. No. 95,975
Int. Cl. C07d *7/06*
U.S. Cl. 260—343 7 Claims

The invention relates to inhibiting the development of color formation of monomeric lactones such as epsilon-caprolactone by incorporating therein an inhibiting amount of certain triorgano phosphorus compounds as exemplified by triphenylphosphine.

3,752,829

4-CYCLOHEXYLVULPINIC ACID DERIVATIVES

Blaine M. Sutton, Hatboro, Pa., assignor to Smith Kline & French Laboratories, Philadelphia, Pa.

No Drawing. Continuation-in-part of abandoned application Ser. No. 188,439, Oct. 13, 1971. This application Aug. 21, 1972, Ser. No. 282,534
Int. Cl. C07d *5/06*
U.S. Cl. 260—343.6 11 Claims

4 - cyclohexylvulpinic acid derivatives having anti - arthritic activity prepared by alcoholysis of the corresponding 4-cyclohexylpulvinic acid dilactone.

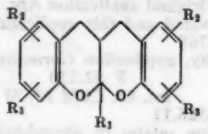
3,752,830

SUBSTITUTED PYRANO[2,3-b]PYRANS

Max von Strandtmann, Rockaway, Marvin P. Cohen, Mendham, and John Shavel, Jr., New Milford, N.J., assignors to Warner-Lambert Company, Morris Plain, N.J.

No Drawing. Filed Feb. 4, 1971. Ser. No. 112,830
Int. Cl. C07d *7/46*
U.S. Cl. 260—345.2 2 Claims

The present invention discloses novel substituted pyrano[2,3-b]pyrans of Formula I below:



(I)

wherein R_1 is a disubstituted amine, R_2 and R_3 are H, alkyl, halo, lower alkoxy, aryloxy, aralkyloxy, or R_2 and R_3 taken together with the aromatic ring form a second aromatic or heteroaromatic ring.

The compounds of this invention possess bronchodilator properties.

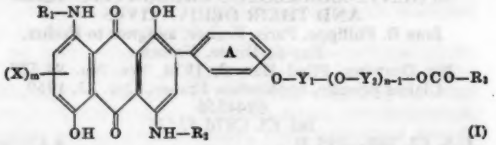
3,752,831

ANTHRAQUINONE DYESTUFFS

Michael Diamantoglou, Erlenbach, Germany, and Hans Peter Koelliker, Munchenstein, Alfred Staub, Binningen, Hans Bosshard, Basel, and Urs Karlen, Magden, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Filed Apr. 26, 1971, Ser. No. 137,656
Claims priority, application Switzerland, Apr. 28, 1970, 6,352/70
Int. Cl. C09b *1/50*
U.S. Cl. 260—376 5 Claims

Anthraquinone dyestuffs which are sparingly soluble in water and are free of groups which dissociate in water to give an acid reaction and impart solubility in water, of the Formula I



(I)

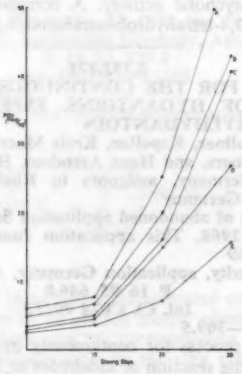
in which R_1 and R_2, independently of one another, each denote hydrogen or a lower alkyl group, X denotes hydrogen or halogen, Y_1 and Y_2, independently of one another, each denote a lower alkylene group which is optionally substituted by a hydroxyl group or a lower alkoxy group, *m* and *n* each denote one of the numbers 1 or 2, and R_3 denotes an optionally substituted aliphatic or aromatic hydrocarbon radical or a lower alkylamino, a cycloalkylamino or an optionally ring-substituted arylamino group, and in which the benzne ring A is optionally substituted further by halogen, or by a lower alkyl or lower alkoxy group.

3,752,832

PROCESS FOR ANTI-OXIDATION AGAINST LIPID

Sadanobu Maruyama and Tsueno Wakayama, Tokyo, Japan, assignors to Kongo Yakuhin Kabushiki Kaisha, Toyama-ken, Japan

Filed Sept. 3, 1971, Ser. No. 177,758
Claims priority, application Japan, Sept. 8, 1970, 45/78,633; Dec. 11, 1970, 45/109,726
Int. Cl. C11b *5/00*
U.S. Cl. 260—398.5 5 Claims



Process for anti-oxidation against lipid characterized in permitting co-existence of tocopherol and unsaponifiable matter of rice oil against said lipid.

3,752,833

PHOSPHATIDE SEPARATION

Rajindra Aneja, Welwyn Garden City, and Jaswinder Singh Chadha, London, England, assignors to Lever Brothers Company, New York, N.Y.

No Drawing. Filed Aug. 27, 1971, Ser. No. 175,731

Claims priority, application Great Britain, Sept. 23, 1970, 45,295/70

Int. Cl. A23j 7/00; C07f 9/02

U.S. Cl. 260—403 14 Claims

N-acylphosphatides, for instance N-acetylcephalin, are separated from phosphatides without an acylatabe amino group, for instance lecithin, by making a mixture containing them acid to the equivalent of pH less than 3.5 under aqueous conditions and solvent-fractionating with acetone or methyl acetate.

3,752,834

PROCESS FOR PREPARING ALKYL TITANATES FROM TITANIUM TETRACHLORIDE AND ALCOHOLS

Guy Marie Paul Bardinet, Thann, and Roger Emile Jules Keck, Cernay, France, assignors to Fabriques de Produits Chimiques de Thann et de Mulhouse, Thann, France

Filed Apr. 9, 1971, Ser. No. 132,722

Claims priority, application France, Apr. 17, 1970, 13,930

Int. Cl. C07f 7/28

U.S. Cl. 260—429.5 6 Claims

Alkyl titanates are prepared by esterifying titanium tetrachloride with an alkanol and neutralizing the hydrochloric acid with ammonia in a process in which the pH of the reaction mixture is kept at about 4–6 until all the titanium tetrachloride has been introduced into the reactor and then continuing to introduce ammonia until pH of the reaction medium is about 9. This procedure facilitates removal of the precipitated ammonium chloride from the solution of alkyl titanate.

3,752,835

PROCESS FOR PREPARING DIALKYLTIN DICHLORIDE AND AN ALKYLLEAD CHLORIDE CO-PRODUCT

Hymin Shapiro and Paul Kobetz, Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

No Drawing. Filed July 19, 1971, Ser. No. 163,990

Int. Cl. C07f 7/22

U.S. Cl. 260—429.7 14 Claims

A process for the production of dialkyltin dichloride compounds and an alkyllead chloride co-product by the reaction of tetraalkyllead and tin tetrachloride in the presence of a solvent is disclosed.

3,752,836

CHROME COMPLEXED AZOMETHINE DYE

Elbert M. Idelson, Newton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

No Drawing. Original application June 4, 1969, Ser. No. 830,499, now Patent No. 3,597,200. Divided and this application Oct. 23, 1970, Ser. No. 83,595

Int. Cl. C07f 11/00

U.S. Cl. 260—438.5 R 3 Claims

Novel metal-complexed azomethine dyes which are also silver halide developing agents, novel non-complexed azomethines useful in the preparation of the same, and novel photographic systems and procedures employing the aforementioned metal complexes to obtain color images, particularly systems and procedures for preparing color images by diffusion transfer.

3,752,837

ANTIMONY AMINOALKOXIDE

Hiroshi Okuto, Toyonaka, and Kiyoshi Yasuda, Ikeda, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

No Drawing. Filed May 17, 1971, Ser. No. 144,319

Claims priority, application Japan, May 18, 1970, 45/42,286; Dec. 25, 1970, 45/129,651

Int. Cl. C07f 9/90

U.S. Cl. 260—446 3 Claims

Novel antimony aminoalkoxides which are prepared by allowing antimony trioxide to react with aminoalcohol, and the antimony aminoalkoxides are usable as fire retardants.

3,752,838

METHYLCARBAMOYLOXY-THIOLCARBANILATES

Mathias H. J. Weiden, Raleigh, N.C., and Linwood K. Payne, Jr., deceased, late of Charleston, W. Va., by Betty Lou B. Payne, executrix, Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 817,152, Apr. 17, 1969, which is a continuation-in-part of application Ser. No. 521,410, Jan. 18, 1966. This application July 15, 1970, Ser. No. 55,244

Int. Cl. C07c 155/08

U.S. Cl. 260—455 A 8 Claims

A new series of methylcarbamoyloxy-thiolcarbanilates have been found to be exceptionally active insecticides, particularly against larval stages of lepidopterous pests. These compounds are effective insecticides.

3,752,839

HYDROCYANATION OLEFINS

William C. Drinkard, Jr., Wilmington, and Richard V. Lindsey, Jr., Hockessin, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 858,098, Sept. 15, 1969, which is a continuation-in-part of application Ser. No. 679,608, Nov. 1, 1967. This application July 2, 1970, Ser. No. 52,143

Int. Cl. C07c 121/04

U.S. Cl. 260—465.8 R 12 Claims

Process of adding hydrogen cyanide to nonconjugated carbon-carbon double bonds such as in 4-pentenenitrile at from −25 to 200° C. using catalysts of the structure $Pd(PX_3)_4$ where X is R or OR and R is an alkyl or aryl group of up to 18 carbon atoms.

3,752,840

PROCESS FOR PREPARING FLUOROPERHALO-ALKYL NITRILES

Bryce C. Oxenrider, Florham Park, and Cyril Woolf and Robert A. Dear, Morristown, N.J., and Wilhelmus M. Beyleveld, Deventer, Netherlands, assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed July 9, 1971, Ser. No. 161,335

Int. Cl. C07c 121/02

U.S. Cl. 260—465.7 4 Claims

Fluoroperhaloalkyl nitriles are prepared by reacting a fluoroperhalo-1-olefin with cyanogen and an ionizable fluoride salt.

3,752,841

PROCESS FOR THE PREPARATION OF CARBAMATES OF ALKYLTHIOLHYDROXAMATES AND INTERMEDIATES

Julius J. Fuchs, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of abandoned application Ser. No. 46,549, June 15, 1970. This application May 14, 1971, Ser. No. 143,667

Int. Cl. C07c *131/00, 121/02, 121/30*

U.S. Cl. 260—453 R 10 Claims

Chlorination of aldoximes in a solvent containing at least 10% by weight of dimethylformamide (DMF) provides alkylhydroxamic acid chlorides in better yields than are obtained when the chlorination is carried out in water. In the same solvent, the alkylhydroxamic acid chlorides can be converted to alkylthiolhydroxamates by reaction with a mercaptan and base, and the alkylthiolhydroxamates can be converted to alkylthiolhydroxamate carbamates by reaction with isocyanic acid or methyl isocyanate. By this procedure both the intermediate alkylthiolhydroxamates and the final carbamates are obtained in higher yield than when the series of reactions are run in water alone. The carbamates are highly effective insecticides.

3,752,842

N-(β-CYANO-ETHYL)-N,N'-BIS-[(1-AMIDO-2,2,2-TRICHLORO)-ETHYL]-ALKYLENEDIAMINES

Walter Ost, Klaus Thomas, and Dietrich Jerchel, Ingelheim am Rhein, and Karl-Richard Appel, Biberach, Rissegg, Germany, assignors to C. H. Boehringer Sohn, Ingelheim am Rhein, Germany

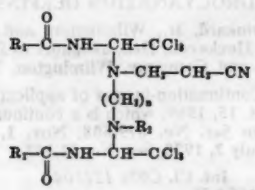
No Drawing. Continuation-in-part of application Ser. No. 793,187, Jan. 22, 1969, now Patent No. 3,595,916. This application Mar. 25, 1971, Ser. No. 128,169

Claims priority, application Austria, Jan. 23, 1968, A 674/68; May 17, 1968, A 4,795/68

Int. Cl. C07c *121/42*

U.S. Cl. 260—465.4 11 Claims

Compounds of the formula



wherein

R_1 is hydrogen, alkyl of 1 to 4 carbon atoms, chloromethyl or dichloromethyl,

R_2 is hydrogen or β-cyano-ethyl, and

n is 2 or 3;

the compounds are useful as fungicides.

3,752,843

ALIPHATIC DI-OLEFINIC NITRILES

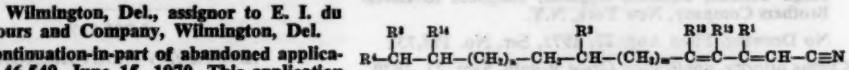
Clive A. Henrick, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

No Drawing. Continuation-in-part of applications Ser. No. 111,767, Ser. No. 111,701, and Ser. No. 111,673, all Feb. 1, 1971. This application Oct. 8, 1971, Ser. No. 187,898

Int. Cl. C07c *121/30*

U.S. Cl. 260—465.9 10 Claims

Novel aliphatic hydrocarbon di-olefinic acids, esters, aldehydes, ketones, thiolesters, alcohols, thiols, halides, nitriles, amines, amides and derivatives thereof, intermediates therefor, syntheses thereof and the control of insects, one embodiment of which is represented by the following formula:



wherein R^1 and R^2 are lower alkyl, R^4 is alkyl, each of R^3, R^{12}, R^{13}, and R^{14} is hydrogen or lower alkyl, and each of *m* and *n* is zero or one, two, or three.

3,752,844

ESTERS OF INDENYL ALKANOIC ACIDS

Karl Pfister, Westfield, Meyer Sletzinger, North Plainfield, and David F. Hinkley, Plainfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Continuation of abandoned application Ser. No. 26,438, Apr. 7, 1970. This application Oct. 1, 1971, Ser. No. 185,873

Int. Cl. C07c *147/14*

U.S. Cl. 260—470 3 Claims

New acyloxyalkyl esters of indenyl acetic acids. These compounds are useful as in vivo cleavable, long-lasting anti-inflammatory and analgesic agents. Also included are processes for preparing these compounds.

3,752,845

N,N-BIS-HALOGENOMETHYL-CARBAMIC ACID ESTERS

Claus Beermann, Neu-Isenburg, Volkmar Georgi and Karl Waldmann, Frankfurt am Main, and Erhard Wolf, Hofheim am Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed July 8, 1969, Ser. No. 840,028

Claims priority, application Germany, July 19, 1968, P 17 68 983.7

Int. Cl. C07c *125/06*

U.S. Cl. 260—482 C 6 Claims

N,N-bis-halogenomethyl-carbamates are formed by reacting urethanes with formaldehyde or compounds capable of yielding formaldehyde and halogenating agents, especially inorganic acid halides. The compounds are useful intermediates and cross-linking agents.

3,752,846

PROCESS FOR PREPARATION OF BIS(β-HYDROXYETHYL) TEREPHTHALATE

Yataro Ichikawa and Gentaro Yamashita, Iwakuni, Yuichi Akachi, Ishikawa-ken, and Mutsushi Suzuki and Osamu Kobayashi, Yamaguchi-ken, Japan, assignors to Teijin Limited, Osaka, Japan

Continuation-in-part of abandoned application Ser. No. 737,334, June 17, 1968. This application Aug. 24, 1970, Ser. No. 66,435

Int. Cl. C07c *69/82*

U.S. Cl. 260—475 P 5 Claims

Preparation of bis-(β-hydroxyethyl)terephthalate by reacting terephthalic acid with ethylene oxide in an aromatic hydrocarbon medium, i.e. benzene, toluene and xylene, of an amount at least 1.5 times the weight of the terephthalic acid in the presence of an organic base or its salt, such as triethylamine, as a catalyst at a temperature of 150° C. to 230° C. for 1 to 30 minutes, the amount of ethylene oxide being 1.5 to 15 mols per mol of the terephthalic acid. The product has a satisfactory optical density and the amounts of the by-products are reduced. A fiber-forming polyester may be produced from the bis-(β-hydroxyethyl) terephthalate so obtained.

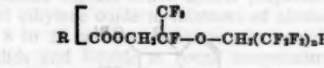
3,752,847

FLUORINATED ESTERS OF POLYCARBOXYLIC ACIDS

James C. Fletcher, Administrator of the National Aeronautic and Space Administration, with respect to an invention of Laurence W. Breed, Overland Park, Kans., and Richard L. Elliott, Kansas City, Mo.

No Drawing. Filed Sept. 23, 1971, Ser. No. 183,240
Int. Cl. C07c 69/42
U.S. Cl. 260—485 F 4 Claims

Fluorine-containing esters of polycarboxylic acids having the formula



where R is a saturated hydrocarbon radical of 2 to 20 carbon atoms having only one carboxy group attached to any one carbon atom, *m* is a whole number of 2 to 4 and *n* is a whole number of 1 to 5. Esters embodying the invention are useful for extreme-temperature lubricants and base fluids for greases.

3,752,848

PREPARATION OF TETROLIC ACID

William Novis Smith, Jr., Exton, Pa., assignor to Foote Mineral Company, Exton, Pa.

No Drawing. Filed Nov. 20, 1970, Ser. No. 91,549
Int. Cl. C07c 51/00, 57/18
U.S. Cl. 260—526 N 9 Claims

Tetrolic acid is prepared by passing carbon dioxide through a slurry in an inert organic liquid of propynyllithium, propynylsodium or propynylpotassium and hydrolyzing the carbonated slurry.

3,752,849

MANUFACTURE OF LEVULINIC ACID

Masatomi Otsuka, Naruto, Yoshio Hirose and Tsukuru Kinoshita, Tokushima, and Takesi Masawa, Naruto, Japan, assignors to Otsuka Kagaku Yakuhin Kabushiki Kaisha, Osaka-shi, Japan

No Drawing. Filed Mar. 12, 1971, Ser. No. 123,831
Claims priority, application Japan, Mar. 18, 1970, 45/23,315
Int. Cl. C07c 59/22
U.S. Cl. 260—531 R 9 Claims

In manufacturing levulinic acid by heating furfuryl alcohol in a diluted acid for a ring-cleavage reaction to produce levulinic acid, the present process is characterized in that the reaction is conducted in the presence of a water-soluble aliphatic ketone.

3,752,850

FLUORINATION OF ALIPHATIC COMPOUNDS

Otto Scherer, Bad Soden, Taunus, Jurgen Korinth, Hofheim, Taunus, and Peter Frisch, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Application Dec. 15, 1966, Ser. No. 601,846, which is a continuation-in-part of application Ser. No. 248,866, Jan. 2, 1963, both now abandoned. Divided and this application Dec. 24, 1970, Ser. No. 101,439
Int. Cl. C07c 49/16, 53/14, 53/34
U.S. Cl. 260—544 F 20 Claims

Fluorination of halogenated aliphatic hydrocarbon is effected by reacting said hydrocarbons with hydrogen fluoride in gaseous phase at elevated temperatures in the presence of a catalyst, the empirical composition of which varies such as between $CrF_{1.5}O_{1.5}$ and CrF_2O or a catalyst, the empirical composition of which varies such as between $CrFO_2$ and CrF_2O.

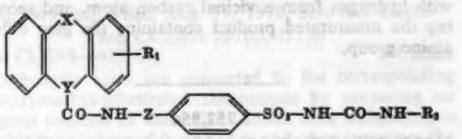
3,752,851

ANTI-DIABETICALLY ACTIVE SULFONYL-UREAS AND SULFONYL-SEMICARBAZIDES

Werner Winter, Mannheim, Erich Fauland and Kurt Stach, Mannheim-Waldhof, Felix Helmut Schmidt, Mannheim-Neuostheim, and Walter Aumuller, Kelkheim-Munster, Germany, assignors to Boehringer Mannheim Gesellschaft mit beschrankter Haftung

No Drawing. Original application Mar. 11, 1968, Ser. No. 711,840, now Patent No. 3,646,009. Divided and this application Sept. 21, 1971, Ser. No. 182,516
Claims priority, application Germany, Mar. 15, 1967, B 91,627
Int. Cl. C07c 127/00
U.S. Cl. 260—553 DA 6 Claims

Novel sulfonyl ureas having the formula:



wherein X represents oxygen, sulfur, saturated, unsaturated, straight or branched chain alkylene containing up to 3 carbon atoms, oxymethylene, thiamethylene, thiaethylene, iminomethylene, alkylated iminomethylene, acylated iminomethylene, carboximido, alkylated carboximido, or a valency bond, R_1 is hydrogen, halogen, alkyl, alkoxy or trifluoromethyl, Y is saturated, unsaturated, straight or branched chain alkylene containing up to 6 carbon atoms or such alkylene group containing a nitrogen or oxygen atom, Z is straight or branched chain alkylene containing up to 4 carbon atoms and R_2 is straight or branched chain, saturated or unsaturated alkyl or cycloalkyl, and such groups interrupted by oxygen or sulfur atoms or containing an endo-alkylene group and substituted or unsubstituted aryl or aralkyl.

The aforesaid sulfonyl ureas constitute extremely effective anti-diabetic agents.

3,752,852

OXIMINO CYCLIC HYDROCARBONS

Anderson O. Dotson, Jr., New Brunswick, and Jerome Robert Olechowski, Trenton, N.J., assignors to Cities Service Company, New York, N.Y.

No Drawing. Filed Aug. 20, 1971, Ser. No. 175,782
Int. Cl. C07c 131/08
U.S. Cl. 260—566 A 1 Claim

A method for manufacturing oximino cyclic hydrocarbons by dehydrohalogenation of oximino halo cyclic hydrocarbons and novel compositions obtained thereby are disclosed.

3,752,853

GEM-DIFLUOROAMINO UNSATURATED HYDROCARBONS

Charles M. Orlando, Union City, Ferdinand Cataneo, Cranford, and Lawrence J. Engel, Dunellen, N.J., assignors to Esso Research and Engineering Company

No Drawing. Filed June 14, 1963, Ser. No. 289,770
Int. Cl. C07c 87/22
U.S. Cl. 260—583 NH 8 Claims

1. The compound 3,3-bis(difluoramino)butyne-1 having the formula:

$$CH_3C(NF_2)_2C{\equiv}CH$$

2. The compound 3,3-bis(difluoramino)pentadiene-1,4 having the formula:

$$CH_2{-}CHC(NF_2)_2CH{=}CH_2$$

8. Method of preparing an internal gem difluoramino substituted unsaturated aliphatic hydrocarbon product which comprises reacting a dehydrohalogenating reactant

with a halogen substituted saturated aliphatic hydrocarbon selected from the group of compounds having the following formulas:

$CH_3—C(NF_2)_2—CH_2—CHX—CH_2X$
$CH_3—C(NF_2)_2—CH_2—CH_2X$
$CH_3—C(NF_2)_2—CHX—CH_2X$
$CH_2X—CH_2—C(NF_2)_2—CH_2—CH_2X$
$CH_2X—CHX—C(NF_2)_2—CHX—CH_2X$
$CH_2X—CH_2—C(NF_2)_2—CHX—CH_2X$
$CHX_2—CH_2—C(NF_2)_2—CHX—CH_2X$
$CH_3—CX_2—CH_2—C(NF_2)_2—CH_2—CH_2X$
$CH_3—CH_2—C(NF_2)_2—CH_3$

wherein X represents a halogen selected from the group consisting of chlorine and bromine to remove the halogen with hydrogen from a vicinal carbon atom, and recovering the unsaturated product containing the gem difluoramino group.

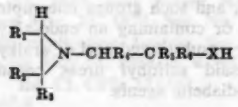
3,752,854

HOMOPOLYMERS OF N - (2 - HYDROXYETHYL) AZIRIDINES AND N-(2-THIOETHYL)AZIRIDINES AND A METHOD OF PREPARATION

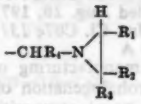
Donald A. Tomalia and Narayanlal D. Ojha, Midland, Mich., assignors to The Dow Chemical Corporation, Midland, Mich.

No Drawing. Filed Jan. 28, 1970, Ser. No. 6,558
Int. Cl. C07c *93/02*
U.S. Cl. 260—584 B **17 Claims**

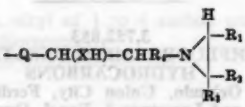
Homopolymers of aziridines having the structural formula



wherein X is oxygen or sulfur, R_1–R_5 are hydrogen or hydrocarbon groups, and R_6 is hydrogen, a hydrocarbon group or



or



wherein Q is an inert divalent organic radical, are prepared in a polymerization reaction which comprises maintaining said monomer(s) in liquid phase with sulfur dioxide until the polymeric product is formed. The polymers are obtained as a complex with SO_2, and SO_2 may be included within the backbone structure, e.g., as a sulfite linkage. The polymers are useful as flocculants and as fugitive sizing agents. For example, N-(2-hydroxyethyl) aziridine homopolymerizes in liquid sulfur dioxide at a temperature of −10° C. to give a polymer having the repeating unit $\{CH_2CH_2—NH—CH_2CH_2O\}$ as a complex with SO_2.

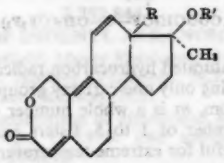
3,752,855

NOVEL 2-OXA-STEROIDS

Robert Bucourt and Lucien Nedelec, Clichy-sous-Bois, France, assignors to Roussel UCLAF, Paris, France

No Drawing. Original application Aug. 14, 1968, Ser. No. 752,467, now Patent No. 3,595,877. Divided and this application Feb. 3, 1971, Ser. No. 112,408
Claims priority, application France, Aug. 17, 1967, 118,090, 118,091; Dec. 7, 1967, 131,343; Mar. 7, 1968, 142,767
Int. Cl. C07c *49/00*
U.S. Cl. 260—586 H **3 Claims**

2 - oxa - 13β - R-17α-methyl-$\Delta^{4,9,11}$-gonatrienes of the formula



(I)

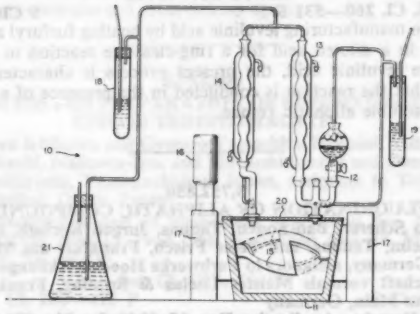
wherein R is selected from the group consisting of methyl and ethyl and R′ is selected from the group consisting of hydrogen, saturated alkyl of 1 to 5 carbon atoms which may contain a hetero oxygen atom, unsaturated alkyl of 2 to 5 carbon atoms, cycloalkyl of 3 to 5 carbon atoms which may contain a hetero oxygen atom, with the proviso that R is ethyl when R′ is hydrogen which compounds possess anabolic and androgenic activity. The invention also relates to a novel process and novel intermediates for the preparation of the compounds of Formula I.

3,752,856

PROCESS FOR THE PRODUCTION OF BROMINATED AROMATIC COMPOUNDS

Georges F. Nagy, Montrouge, Daniel Balde, Levallois-Perret, and Pierre Deloy, Colombes, France, assignors to Ugine Kuhlmann, Paris, France

Filed Feb. 2, 1970, Ser. No. 7,662
Claims priority, application France, Feb. 3, 1969, 6902243
Int. Cl. C07c *41/00*
U.S. Cl. 260—612 R **5 Claims**



The present invention relates to a process for the production of aromatic compounds brominated on the ring portion or nucleus thereof and more specifically to the production of such compounds having a high melting point, comprising forming a solventless reaction mixture of elemental bromine and an aromatic compound and maintaining the reaction mixture during the period of reaction under constant agitation at a force sufficient to intimately mix the reactants and to crush solid brominated compounds formed by the reaction.

3,752,857

NONIONIC SURFACTANT WITH LOW POUR POINT

John Gordon Milligan, Austin, Tex., assignor to Jefferson Chemical Company, Inc., Houston, Tex.

No Drawing. Continuation-in-part of application Ser. No. 790,445, Jan. 10, 1969, which is a continuation-in-part of application Ser. No. 671,995, Oct. 2, 1967, both now abandoned. This application Apr. 27, 1970, Ser. No. 32,423

Int. Cl. C07c 41/02

U.S. Cl. 260—615 B 1 Claim

Nonionic surface-active agents prepared by the addition of ethylene oxide to mixtures of alcohols containing from 8 to 20 carbon atoms are often solids or mixtures of solids and liquids at room temperatures. The pour points of such nonionic surfactants can be lowered without appreciably adversely affecting other properties by the sequential addition of ethylene oxide, propylene oxide and ethylene oxide to the alcohol if the initial oxyethylene block contains from 30% to 60% of the total oxyethylene groups in the molecule.

3,752,858

PHENOL NITRATION PROCESS

Joseph D. Odenweller, Bloomfield Hills, Mich., assignor to Ethyl Corporation, Richmond, Va.

No Drawing. Filed Apr. 13, 1970, Ser. No. 28,013

Int. Cl. C07c 79/24

U.S. Cl. 260—622 R 8 Claims

A process is provided for making 2,4-di-nitro-6-sec-alkylphenols using both 2,6-di-sec-alkylphenols and o-sec-alkylphenols as starting material. In the first step, 2,6-di-sec-alkylphenols are added to excess concentrated sulfuric acid at 75–150° C. causing concurrent dealkylation and sulfonation. In the second step, o-sec-alkylphenols are added to consume most of the remaining sulfuric acid, permitting replacement of sulfonic acid groups with nitro groups by reacting the final mixture with aqueous alkali metal nitrates. The products (e.g., 2,4-di-nitro-6-sec-butylphenol) are useful as selective herbicides.

3,752,859

PREPARATION OF ALDEHYDES FROM OLEFINS

Raymond A. Schell, Berkley, Mich., assignor to Ethyl Corporation, Richmond, Va.

No Drawing. Continuation-in-part of abandoned application Ser. No. 626,681, Mar. 29, 1967. This application Dec. 8, 1969, Ser. No. 883,305

Int. Cl. C07c 45/08

U.S. Cl. 260—604 HF 9 Claims

Aldehydes are prepared by reacting carbon monoxide with an olefin and a primary alcohol in the presence of a rhodium halide catalyst. For example, when hexene-1 is reacted with methanol and carbon monoxide in the presence of a catalytic quantity of rhodium (III) chloride trihydrate, a mixture of n-heptaldehyde and 1-methylhexanal results. As a by-product, the alcohols corresponding to the aldehydes are also produced in many instances.

3,752,860

CARBONYLATION OF ORGANOBORANES IN THE PRESENCE OF COMPLEX METAL HYDRIDES

Herbert C. Brown, 1840 Garden St., Lafayette, Ind. 46012

No Drawing. Filed May 20, 1968, Ser. No. 730,653

Int. Cl. C07c 27/00, 31/00, 31/14

U.S. Cl. 260—632 R 8 Claims

Metal triorganoborane alcoholate compounds are formed by reacting triorganoborane compounds with carbon monoxide and a complex metal hydride at moderate conditions of temperature and pressure. The alcoholate compounds can subsequently be converted to alcohols and aldehydes. Alcohols are formed by hydrolyzing the alcoholate compound in a basic medium. Aldehydes are secured by oxidizing the alcoholate compound.

3,752,861

PRODUCTION OF HYDROXY COMPOUNDS BY HYDROGENOLYSIS OF BUFFERED CARBOXYLATE SALTS

Charles C. Hobbs and John A. Bedford, Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

No Drawing. Filed Aug. 17, 1970, Ser. No. 64,665

Int. Cl. C07c 29/00, 31/20

U.S. Cl. 260—635 D 3 Claims

Carboxylic acids are converted to the corresponding hydroxymethyl-substituted compounds by preparing an aqueous solution of their alkali metal salts buffered to a pH between about 6.0 and 7.0 and then reacting the buffered salt solution with hydrogen in the presence of a hydrogenolysis catalyst such as active metallic cobalt. In a particularly useful embodiment the potassium salts of carboxylic acids, dicarboxylic acids, and hydroxy-carboxylic acids having at least about four carbon atoms are hydrogenolyzed in a reactor within which the desired buffering is accomplished with potassium bicarbonate in the presence of a finite concentration of free carbon dioxide. After the reaction step the liquid product is degassed at a temperature high enough to decompose potassium bicarbonate to potassium carbonate; the reaction product separates into two phases because of the salting-out action of the resulting potassium carbonate, and the organic products can be recovered by decantation while the aqueous phase, containing reuseable potassium carbonate, is recycled to the acid-neutralization step which precedes the hydrogenolysis.

3,752,862

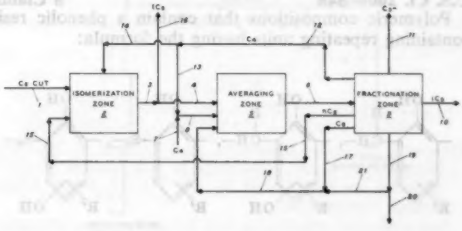
PROCESS FOR CONVERTING BUTANE AND HEXANE INTO ISOPENTANE BY AVERAGING AND ISOMERIZATION

Robert P. Sieg, Piedmont, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 15, 1970, Ser. No. 80,857

Int. Cl. C07c 9/00

U.S. Cl. 260—676 R 8 Claims



A process for converting butane and hexane into isopentane which comprises: (a) averaging a C_6 rich hydrocarbon stream containing less than 1 p.p.m. sulfur with butane in an averaging zone by contacting the C_6 and

butane hydrocarbons with an averaging catalyst having a component which has catalytic activity for alkane dehydrogenation and a component which has catalytic activity for olefin averaging to obtain an nC_8 rich averaging effluent stream, and (b) isomerizing at least a portion of the nC_8 in the averaging effluent stream in an isomerization zone by contacting the nC_8 with an isomerization catalyst at a hydrogen partial pressure between 10 p.s.i.g. and 3,000 p.s.i.g. and a temperature between 100° F. and 900° F. to obtain an iC_8 rich stream.

3,752,863

METHOD FOR THE PRODUCTION OF ISOPRENE

Kazuo Okada, Takeo Wada, and Itsuo Furuoya, Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

No Drawing. Filed July 14, 1971, Ser. No. 162,631
Claims priority, application Japan, July 16, 1970, 45/62,348
Int. Cl. C07c *1/00*
U.S. Cl. 260—681 7 Claims

The present invention relates to a method for producing isoprene by reacting isobutylene with formaldehyde in the vapor phase in the presence of a catalyst comprising silicon dioxide and a bismuth component such as Bi_2O_3. The catalyst may further contain minor amounts of at least one element such as Al, B, W, Fe, Ti, Zr and V.

3,752,864

PROCESS FOR THE ISOMERIZATION OF OLEFINS

Robert P. Arganbright, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

No Drawing. Filed June 30, 1971, Ser. No. 158,530
Int. Cl. C07c *5/22*
U.S. Cl. 260—683.2 11 Claims

Aliphatic hydrocarbon olefins having 4 to 5 carbon atoms are isomerized to their equilibrium mixture over a unique catalyst of $PdO\text{-}WO_3$ on a support. For example, 2-methyl butene-1 at a LHSV of 7 at 57° C. over 2% PdO-10% WO_3 on alumina gave 56.5% yield of 2-methyl butene-2 as compared to 35.6% over a $NiO\text{-}WO_3$ supported prior art catalyst.

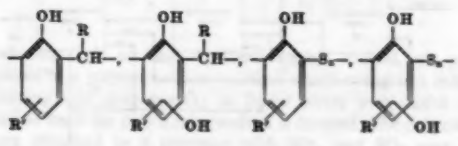
3,752,865

ELECTRICAL CABLES INSULATED WITH EXTRACTION RESISTANT STABILIZED POLYMERS

Frank Scardiglia, Woodcliff Lake, and Kornel D. Kiss, Elmsford, N.Y., assignors to Dart Industries Inc., Los Angeles, Calif.

No Drawing. Continuation-in-part of abandoned application Ser. No. 130,818, Apr. 2, 1971. This application July 20, 1971, Ser. No. 164,450
Int. Cl. C08f *45/60;* C08g *37/16*
U.S. Cl. 260—848 8 Claims

Polymeric compositions that contain a phenolic resin containing repeating units having the formula:



or mixtures thereof wherein R and R' are hydrogen or alkyl, cycloalkyl or aryl radicals having from 1 to 24 carbon atoms, *n* is 1 or 2 and the average number of repeating units in said polymeric compound is at least 3, and a metal deactivator have unexpectedly high thermal oxidative stability after extraction by viscous liquids. These compositions are particularly useful in the insulation of electrical cables which are utilized in environments likely to cause extraction of stabilizer systems.

3,752,866

POLYCARBONATE MODIFIED POLYESTERS OF REDUCED CARBOXYL GROUPS

Marvin LeRoy Doerr, Charlotte, N.C., assignor to Fiber Industries, Inc.

No Drawing. Filed Mar. 23, 1971, Ser. No. 127,367
Int. Cl. C08g *39/10*
U.S. Cl. 260—860 8 Claims

A process is disclosed and claimed which provides for the late addition of a polycarbonate to a fiber-forming polyester melt which results in a polyester having a lower level of carboxyl end groups. The improved polyester of this invention exhibits utility in reinforced rubber articles such as industrial belts and pneumatic tire structures.

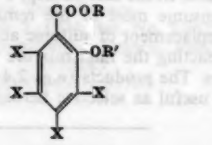
3,752,867

FIREPROOF POLYESTERS FROM HALOGENATED SALICYLIC ACID

Yves Merck and Jean-Marie Vion, Brussels, Belgium, assignors to UCB, Societe Anonyme, Brussels, Belgium

No Drawing. Filed Nov. 8, 1971, Ser. No. 196,742
Claims priority, application Great Britain, Nov. 10, 1970, 53,434/70
Int. Cl. C08f *21/02;* C08g *17/10*
U.S. Cl. 260—869 15 Claims

Fireproof polymers which are the polymerization products of unsaturated polyester resin compositions comprising: (a) a polycondensation product of unsaturated aliphatic polycarboxylic acids, optionally saturated aliphatic carboxylic acids or aromatic carboxylic acids, polyhydric alcohols and halogenated salicylic acids of the formula



wherein X is hydrogen or halogen, at least one X being halogen, R is hydrogen, alkyl or aryl and R' is hydrogen, alkanoyl or aroyl, and (b) a monoethylenically unsaturated copolymerizable monomer.

3,752,868

METHOD FOR PRODUCING DYEABLE POLYOLEFIN

Kanji Kaku, Mitsuo Asaba, Yasaka Gondo, and Atsuyuki Kachi, Kanagawaken, and Satoshi Matsumoto, Chibaken, Japan, assignors to Chisso Corporation, Osaka, Japan

No Drawing. Original application Nov. 25, 1968, Ser. No. 778,763. Divided and this application May 24, 1971, Ser. No. 146,525
Claims priority, application Japan, Dec. 6, 1967, 42/78,323, 42/78,324
Int. Cl. C08f *27/00, 29/12;* D06p *3/06*
U.S. Cl. 260—876 R 7 Claims

Method for producing dyeable polyolefin which comprises graft-copolymerizing a vinyl monomer containing at least one basic nitrogen atom with a polyolefin to an extent more than half the amount to be included in the final graft-copolymerized polymer and then reacting a non-vinylic acidic compound with thus graft-copolymerized product, preferably in the graft-copolymerizing system. This dyeable polyolefin has excellent dye affinity to acid dyes while retaining excellent mechanical properties of polyolefin.

3,752,869
S-(N-ISOBUTYNYL-N-PHENYLCARBAMOYL-METHYL) DITHIOPHOSPHATES

Karl Kiehs, Lampertheim, and Adolf Fischer, Mutterstadt, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen am Rhine, Germany

No Drawing. Filed Oct. 15, 1970, Ser. No. 81,141
Claims priority, application Germany, Oct. 18, 1969, P 19 52 650.2
Int. Cl. A01n *9/36*; C07f *9/16*
U.S. Cl. 260—943 3 Claims

New and valuable thiophosphoric esters which have a good herbicidal action and a process for controlling the growth of unwanted plants with these compounds.

3,752,870
POWDER COATING COMPOSITIONS CONTAINING POLYMER OF ETHYLENICALLY UNSATURATED GLYCIDYL ESTERS, DICARBOXYLIC ACIDS, AND FLOW CONTROL AGENTS

Santokh S. Labana, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

No Drawing. Filed Aug. 16, 1971, Ser. No. 172,236
Int. Cl. C08g *45/04*
U.S. Cl. 260—836 33 Claims

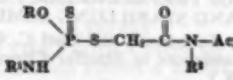
Powder coating compositions are disclosed. In general, individual powder coating compositions are a mixture of the following materials. A copolymer of glycidyl methacrylate and an ethylenically unsaturated compound is formed in such proportions as to obtain a copolymer with a glass transition temperature in the range of 40° C. to 90° C. and a molecular weight ($\overline{M}_n$) in the range of 2500 to 8500. The glycidyl methacrylate is present in the copolymer from at least about 8% by weight to no more than about 25% by weight. Another material of the coating composition is a saturated, straight chain, aliphatic, dicarboxylic acid containing 4 to 20 carbon atoms per molecule in the amount of 0.8 to 1.1 carboxylic groups for each epoxy group in the copolymer. A third material utilized in forming the powder coating mixture is a flow control agent which forms at least 0.05% by weight of the mixture. The flow control agent is a polymer having a molecular weight ($\overline{M}_n$) of at least 1000. The flow control agent also has, at the baking temperature of the powder coating composition, a lower surface tension than the surface tension of the copolymer.

3,752,871
O - ALKYL - N-MONOALKYL-S-(N'-ACYL-CARBAMYLMETHYL) - THIONOTHIOLPHOSPHORIC ACID ESTER AMIDES

Claus Stolzer, Wuppertal-Vohwinkel, Bernhard Homeyer, Opladen, and Ingeborg Hammann, Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed July 22, 1971, Ser. No. 165,411
Claims priority, application Germany, July 30, 1970, P 20 37 855.6
Int. Cl. H01n *9/36*; C07f *9/16, 9/24*
U.S. Cl. 260—938 7 Claims

O-alkyl-N-monoalkyl - S - (N'-acyl-carbamylmethyl)-thionothiolphosphoric acid ester amides of the general formula



(I)

in which

R and R^1 each is an alkyl or alkenyl radical with up to 6 carbon atoms,

R^2 is hydrogen or an alkyl or alkenyl radical with up to 6 carbon atoms, and

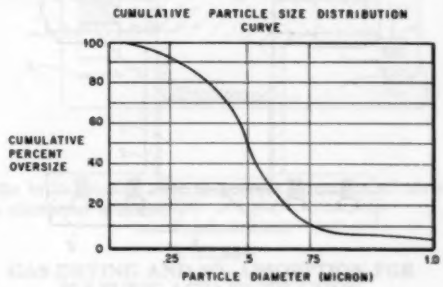
Acyl is an HCO-, alkyl-CO- or alkoxy-CO- radical optionally substituted by halogen or a phenyl-CO-or phenoxy-CO- radical optionally substituted by halogen or an alkyl radical,

which possess nematocidical, insecticidal, acaricidal, and plant growth-promoting properties.

3,752,872
METHOD OF PREPARING UNIFORM SIZE POWDERS

Howard W. Hill, Fremont, Mickey O. Marlowe, Livermore, and Alexis I. Kaznoff, Castro Valley, Calif., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Aug. 26, 1971, Ser. No. 175,155
Int. Cl. G21c *21/02, 21/12*
U.S. Cl. 264—.5 1 Claim

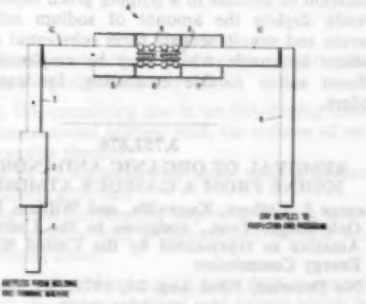


A method for preparing inorganic powders consisting of particles of uniform controlled size in the range 0.2 to 40 microns is described. The procedure utilizes isostatic forming and high temperature sintering to form grains of the desired size. The compact then is disintegrated by cyclic oxidation-reduction to separate the grains along grain boundaries thus preserving the identity of the grains. These grains form the particles of the new powder. The procedure is applicable to UO_2 or other compounds of multivalent cations.

3,752,873
PRINTING PROCESS FOR PLASTIC CONTAINERS

Dan Lewis, Jr., Champaign, Ill., assignor to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of abandoned application Ser. No. 807,841, Mar. 17, 1969. This application Aug. 5, 1971, Ser. No. 169,454
Int. Cl. B29c *25/00*
U.S. Cl. 264—78 9 Claims



Heat diffusable non-drying inks are printed on plastic containers. The residual surface ink is removed in an oven annealing process which is used to control container volume and dry the bottles.

3,752,874

PROCESS FOR MELT SPINNING

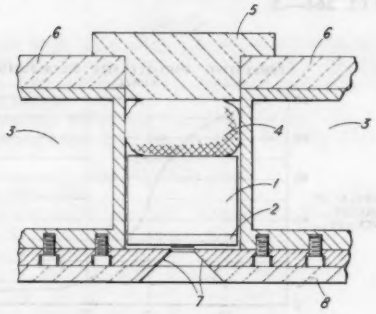
Ronald Bell Coates, Harrogate, England, assignor to Imperial Chemical Industries, London, England

Filed July 26, 1971, Ser. No. 165,985

Claims priority, application Great Britain, Aug. 4, 1970, 37,582/70

Int. Cl. B28b *3/20*; B29c *25/00*

U.S. Cl. 264—176 F 21 Claims



Filaments by melt-spinning through plurality of packs with variation of heat losses from free faces of packs minimized by shields in close proximity with substantially identical temperatures.

3,752,875

PROCESS FOR INCREASING REACTION RATE IN CONVERSION OF SULFIDES AND HYDROSULFIDES

Harold A. O'Hern, Jr., Toledo, Ohio, and Kermit E. Olson, Tomahawk, Wis., assignors to Owens-Illinois, Inc.

Filed Dec. 28, 1970, Ser. No. 101,524

Int. Cl. C01b *17/64*

U.S. Cl. 423—201 17 Claims

A catalytic process for enhancing the rate of oxidation of alkaline solutions of water-soluble, oxidizable, inorganic sulfides and/or hydrosulfides wherein effective catalytic amounts of water-insoluble smelt solids are employed. These solids selectively catalyze the reaction by which thiosulfate is formed. This catalytic process may also be employed for substantially increasing the rate of oxidation of sulfides in a pulping green liquor to thereby greatly deplete the amount of sodium sulfide present therein and simultaneously form substantial quantities of sodium hydroxide which may be employed to absorb effluent sulfur dioxide emanating, for example, from boilers.

3,752,876

REMOVAL OF ORGANIC AND INORGANIC IODINE FROM A GASEOUS ATMOSPHERE

George I. Cathers, Knoxville, and William E. Shockley, Oak Ridge, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Aug. 26, 1971, Ser. No. 175,352

Int. Cl. C01b *7/00*

U.S. Cl. 423—240 5 Claims

A method of removing iodine from a gaseous atmosphere is provided which comprises contacting said iodine-containing atmosphere with a refluxing aqueous solution which is at least 15.3 M in nitric acid under such conditions as to avoid adverse volatilization of iodine.

3,752,877

RECOVERY OF SULFUR COMPOUNDS FROM TAIL GASES

David K. Beavon, Los Angeles, Calif., assignor to The Ralph Parsons Company, Los Angeles, Calif.

Continuation-in-part of application Ser. No. 853,286, Aug. 27, 1969. This application Mar. 19, 1971, Ser. No. 126,280

Int. Cl. C01b *17/16*

U.S. Cl. 423—244 12 Claims

Gas streams containing sulfur, water, sulfur dioxide, carbonyl sulfide, and carbon disulfide are enriched with hydrogen and catalytically hydrogenated and hydrolyzed to hydrogen sulfide which is remove.

3,752,878

HYDROLYSIS OF ARYL HALIDES WITH A RARE EARTH METAL PHOSPHATE

William L. Kehl and Raymond J. Rennard, Jr., Pittsburgh, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed Dec. 30, 1970, Ser. No. 103,003

Int. Cl. C01f *17/00*

U.S. Cl. 423—263 13 Claims

Aryl halides, such as chloroxylene, are hydrolyzed to the corresponding ring hydroxylated aryl compounds, such as xylenol, by contacting the aryl halides and steam with a rare earth metal phosphate catalyst, such as lanthanum phosphate, cerium phosphate and neodymium phosphate. A method of preparing the rare earth metal phosphate is also disclosed. The addition of small amounts of copper greatly improves the activity of the catalyst.

3,752,879

PROCESS FOR MANUFACTURING SODIUM PHOSPHATES

Giorgio Cozza, Milan, Carlo Scaglia, Busto Arsizio, and Filippo Barilli, Milan, Italy, assignors to Societa Italiana Resine S.p.A., Milan, Italy

Filed Dec. 10, 1970, Ser. No. 96,815

Claims priority, application Italy, Dec. 23, 1969, 26,208/69

Int. Cl. C01b *15/16, 25/26*

U.S. Cl. 423—315 3 Claims

The degree of salification of phosphoric acid in its part neutralisation with sodium hydrate for sodium tripolyphosphate manufacture is controlled by withdrawing samples, titrating to convert wholly to disodium phosphate then to convert the same sample wholly back to monosodium phosphate, and controlling the admission of sodium hydrate to the neutralisation according to the relative amounts of the titrating agents required. The titration is preferably potentiometric, making use of the inflections in the curve at these points.

3,752,880

METHOD OF PREPARING ISOCYANIC ACID AND STABILIZING SAME

Walter Stamm, Tarrytown, and Carl C. Greco, Garnerville, N.Y., assignors to Stauffer Chemical Company, New York, N.Y.

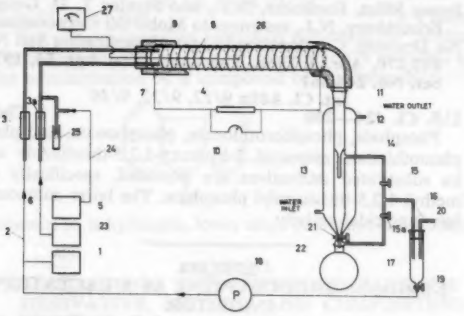
Continuation-in-part of abandoned application Ser. No. 426,285, Jan. 18, 1965. This application Mar. 17, 1969, Ser. No. 807,677

Int. Cl. C01c *3/00, 3/14*

U.S. Cl. 423—365 15 Claims

A method for the preparation of isocyanic acid from carbamoyl chloride with a hydrogen chloride abstractor, the basicity of which is sufficient to abstract hydrogen chloride from the carbamoyl chloride but insufficient to

cause polymerization of the formed isocyanic acid. Preferred hydrogen chloride abstractors are the weak Lewis bases such as the ethers, thioethers and N,N-disubstituted amides.



3,752,881
PROCESS FOR PRODUCTION OF AZIDES
William K. Snead, Wheeling, W. Va., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed Nov. 24, 1970, Ser. No. 92,372
Int. Cl. C01b *21/08*
U.S. Cl. 423—410 **10 Claims**

Hydrazoic acid is produced by acidifying alkali metal azide or alkaline earth metal azide. Hydrozoic acid dissolved in the by-product liquid resulting from the acidification is stripped and entrained in a flow of inert gas which removes the stripped hydrazoic acid vapor from the stripping system. The hydrazoic acid is contacted with a basic alkali metal or alkaline earth metal compound and the inert gas withdrawn and recycled to the process.

3,752,882
FLUX FOR GALVANIZING, TIN PLATING AND LEAD COATING
Wolfgang Muller, Mannheim-Rheinau, Germany, assignor to Th. Goldschmidt, A.G., Essen, Germany
No Drawing. Filed May 16, 1969, Ser. No. 825,451
Claims priority, application Germany, Dec. 12, 1968, P 18 14 258.0
Int. Cl. C01b *9/00*
U.S. Cl. 423—463 **4 Claims**

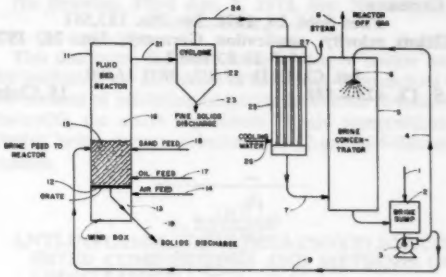
This invention relates to a compound having the formula

$$ZnCl_2 \cdot Zn(NH_3)_2Cl_2 \cdot 3NH_4Cl$$

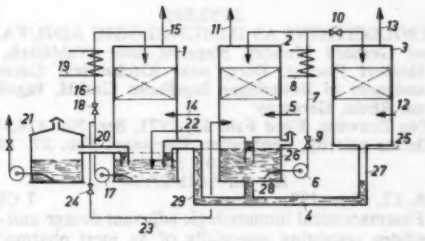
and to a process for the preparation thereof. The compound is useful as a flux for galvanizing, tin plating, lead coating, and soldering processes.

3,752,883
PROCESS FOR THE PRODUCTION OF HYDROGEN HALIDES FROM A BRINE
William Percy Moore, Jr., Chester, Va., assignor to Allied Chemical Corporation, New York, N.Y.
Filed Apr. 1, 1971, Ser. No. 130,357
Int. Cl. C01b *7/08, 7/12*
U.S. Cl. 423—481 **3 Claims**

A process for the production of hydrogen halides from halide brines containing bromides by treating the brine in a reactor containing a fluidized bed of particles maintained in a fluidized state by upward passage of gases at elevated temperatures producing halides, the gases being generated by burning a fluid fuel with oxygen or oxygen containing gas, and maintaining a reducing atmosphere in the brine treating zone to prevent formation of corrosive elemental bromine.



3,752,884
GAS DRYING AND SO_3-ABSORPTION FOR SULFURIC ACID PRODUCTION
Joachim Sasse, Junkersdorf, Germany, assignor to Chemiebau, Dr. A. Zieren GmbH & Co. KG, Cologne, Germany
Filed Oct. 28, 1970, Ser. No. 84,777
Claims priority, application Germany, Oct. 28, 1969, P 19 54 098.8
Int. Cl. C01b *17/72*
U.S. Cl. 423—522 **11 Claims**



In the production of sulfuric acid by the contact process comprising the preliminary steps of

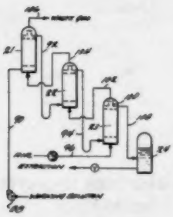
(a) drying SO_2-containing gas in an SO_2-drying tower with a concentrated sulfuric acid, the volume of said acid increasing thereby;
(b) drying air in an air-drying tower with a concentrated sulfuric acid; and
(c) the post catalytic reaction step of absorbing resultant sulfur trioxide with a concentrated sulfuric acid in a scrubbing tower;

the improvement comprising establishing fluid communication between the sumps of all of said towers which interconnects the inlet of the SO_3-absorption tower, the outlet of the SO_2-drying tower and the outlet of the air drying tower with one another. An acid level is obtained in the drying towers and in the SO_3-absorption tower sumps which is dependent on the gas pressure in each respective tower.

3,752,885
PROCESS FOR THE PRODUCTION OF HYDROGEN PEROXIDE

Martin Liebert, Frankfurt, Heinz Delle, Bad Homburg vor der Hohe, and Gerhard Kabisch, Rheinfelden, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Filed Sept. 24, 1971, Ser. No. 183,561
Claims priority, application Germany, Jan. 26, 1970, P 20 03 268.2
Int. Cl. C01b *15/02*; B01l *11/00*
U.S. Cl. 423—588 15 Claims



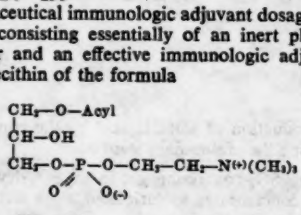
The oxidation step in the anthraquinones process for producing hydrogen peroxide is carried out in a plurality of stages in an apparatus arranged for separating gas and liquid phases. The hydroquinone containing working solution is conducted in each stage in parallel flow from bottom to top with one oxygen containing gas. The stage with the highest hydroquinone concentration in the working solution is led to the gas mixture most depleted in oxygen and the fresh gas mixture is introduced into the stage which contains the working solution poorest in hydroquinone.

3,752,886
LYSOLECITHINS AS IMMUNOLOGIC ADJUVANTS

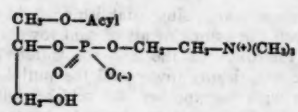
Paul Gerhard Munder, Siegelau, near Waldkirch, and Herbert Fischer, Burg, near Kirchzarten, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

No Drawing. Filed Feb. 23, 1971, Ser. No. 118,084
Claims priority, application Germany, Feb. 27, 1970, P 20 09 343.0
Int. Cl. A61k *27/00*
U.S. Cl. 424—199 7 Claims

Pharmaceutical immunologic adjuvant dosage unit compositions consisting essentially of an inert pharmaceutical carrier and an effective immunologic adjuvant dose of a lysolecithin of the formula



or



wherein Acyl is acyl of an aliphatic fatty acid; and a method of enhancing antigenicity and improving immune response in warm-blooded animals with the aid of such compositions.

3,752,887
METHOD OF COMBATTING FUNGI USING DIMETHYL 1,2,5-THIADIAZOL-3-YL PHOSPHATE

James Billet, Rochester, N.Y., and Stanley T. D. Gough, Branchburg, N.J., assignors to Mobil Oil Corporation

No Drawing. Continuation-in-part of application Ser. No. 813,270, Apr. 3, 1969. This application Apr. 14, 1972, Ser. No. 244,261
Int. Cl. A01n *9/12, 9/22, 9/36*
U.S. Cl. 424—200 1 Claim

Phosphate, phosphorothionate, phosphonate, and phosphonothionate esters of 3-hydroxy-1,2,5-thiadiazole and its substituted derivatives are provided, specifically dimethyl 1,2,5-thiadiazolyl phosphate. The latter compound has fungicidal activity.

3,752,888
2-BROMO-α-ERGOCRYPTINE AS A LACTATION INHIBITOR

Edward Fluckiger, Binningen, and Franz Troxler and Albert Hofmann, Bottmingen, Switzerland, assignors to Sandoz Ltd. (also known as Sandoz AG), Basel, Switzerland

No Drawing. Continuation-in-part of abandoned application Ser. No. 827,144, May 23, 1969. This application Sept. 17, 1971, Ser. No. 181,624
Claims priority, application Switzerland, May 31, 1968, 8,168/68
Int. Cl. A61k *27/00*
U.S. Cl. 424—250 6 Claims

The invention concerns a novel method of inhibiting lactation in a warm-blooded female animal which comprises administering to the animal a dose of from about 0.03 milligram to about 10 milligrams per kilogram animal body weight of 2-bromo-α-ergocryptine.

A process for the production of 2-bromo-α-ergocryptine is also described.

3,752,889
TREATMENT OF CHRONIC FATIGUE FOLLOWING ACUTE DISEASE

James B. Mercer, 13109 W. 95th St., Lenexa, Kans. 66215

No Drawing. Continuation-in-part of abandoned application Ser. No. 860,062, Sept. 22, 1969. This application Apr. 13, 1972, Ser. No. 243,865
Int. Cl. A61k *27/00*
U.S. Cl. 424—273 4 Claims

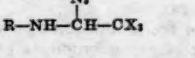
The administration internally to mammals of 1-(β-hydroxyethyl) - 2 - methyl - 5 - nitroimidazole (metronidazole), in a dosage range for adult humans of about 31 to 1000 mgs. per twenty-four hour period, is an effective therapeutic treatment for chronic fatigue which sometimes follows acute disease.

3,752,890
N-(1-AZIDO-2,2,2-TRIHALOETHYL)AZIDES AND CARBAMATES AS NEMATOCIDES

Malcolm S. Singer, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Original application Jan. 7, 1969, Ser. No. 789,595, now Patent No. 3,636,062. Divided and this application June 28, 1971, Ser. No. 163,522
Int. Cl. A01n *9/20*
U.S. Cl. 424—226 10 Claims

Azides of the formula



in which X is Cl or Br and R is a carboxyacyl, sulfonylacyl or alkoxycarbonyl group. These azides are nematocidal.

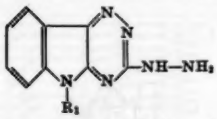
3,752,891

METHOD FOR PRODUCING ANTIHYPERTENSIVE ACTIVITY

Daniel Kamlusky, Parsippany, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

No Drawing. Filed June 4, 1971, Ser. No. 150,203
Int. Cl. A61k 27/00
U.S. Cl. 424—249 8 Claims

The present invention relates to a method for producing antihypertensive activity in a hypertensive mammal by the administration of a compound of the formula:



(I)

wherein R_1 is hydrogen, lower alkyl or phenyl lower alkyl.

3,752,892

ANOREXIGENIC TETRAHYDROBENZAZEPINE DERIVATIVE, METHOD AND COMPOSITION THEREOF

Karl Hoegerle, Basel, and Ernst Habicht, Oberwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Original application Aug. 9, 1968, Ser. No. 751,380, now abandoned. Divided and this application Mar. 11, 1970, Ser. No. 23,526
The portion of the term of the patent subsequent to Feb. 13, 1990, has been disclaimed
Int. Cl. A61k 27/00
U.S. Cl. 424—244 2 Claims

6-chloro-2,3,4,5-tetrahydro-H-3-benzazepine and pharmaceutically acceptable acid addition salts thereof are prepared; pharmaceutical compositions containing said compounds and a method of producing an anorexigenic effect in a mammal are provided.

3,752,893

METHOD FOR INHIBITING GASTRIC ACID SECRETION IN MAMMALS

Henry George Roscoe, Montvale, N.J., and Donald Arthur Blickens, Suffern, and David Kupfer, Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Apr. 2, 1971, Ser. No. 130,811
Int. Cl. A61k 27/00
U.S. Cl. 424—270 5 Claims

This disclosure describes compositions of matter useful for inhibiting the formation of histamine in mammals and the method of inhibiting histamine formation in mammals therewith, the active ingredients of said compositions of matter being certain substituted 3-(2-amino-4-thiazolyl) indoles.

3,752,894

ANTI-INFLAMMATORY DICARBOXYLIC ACID ESTER COMPOSITIONS AND METHODS OF USING SAME

Antonio Esteve, Barcelona, Spain, assignor to Laboratorios Del Dr. S.A., Barcelona, Spain

No Drawing. Filed July 11, 1969, Ser. No. 841,115
Int. Cl. A61k 27/00
U.S. Cl. 424—273 14 Claims

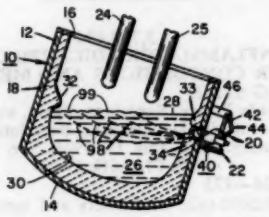
Novel dicarboxylic acid esters and semi-esters of 1,2-diphenyl - 4-n-butyl-4-hydroxyalkyl-3,5-dioxopyrazolidines have been found. One of these, the semi-succinate ester of 1,2-diphenyl-4-n-butyl-4-hydroxymethyl-3,5-dioxopyrazolidine, has been found to have particularly desirable therapeutic properties including a high anti-inflammatory activity and low toxicity. This compound can be used as an anti-inflammatory agent and can be administered orally, rectally or partenterally; either alone or in combination with a corticosteroid, in particular with prednisone.

ELECTRICAL

3,752,895
ELECTRIC MELTING FURNACE AND PROCESS OF USING IT

Thomas A. Clishem; Francis R. Duerr, and Frederick D. Olympia, all of Jefferson County, N.Y., assignors to Corhart Refractories Company, Louisville, Ky.

Division of Ser. No. 58,901, July 29, 1970, Pat. No. 3,703,391.
This application June 6, 1972, Ser. No. 260,125
Int. Cl. F27d *3/16*
U.S. Cl. 13—10 6 Claims



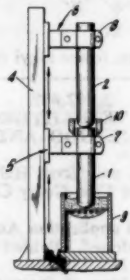
Furnace has carbon electrodes suspended in a refractory-lined melting pot with a tap hole in the middle of a front wall portion thereof. A water-cooled copper lance sealably and removably engages the tap hole for injecting reactive gas into a molten charge in the pot. The lance has a tapered portion for sealably engaging the walls of the tap hole and has a stubby end as the only part thereof protruding inside of and facing into the pot. The stubby end has a plurality of jet orifices for discharging reactive gas, which orifices have axes disposed at an acute downward angle from the horizontal and in a divergent fan-like pattern in the direction of gas flow in the lance. Furnace is operated to produce molten oxidic refractory material by providing a shallow pool of that molten material in the pot, electrically melting further oxidic refractory material by means of the electrodes to enlarge the pool, engaging the water-cooled lance in the tap hole and causing reactive gas, e.g., oxygen, to flow from the lance into the pot, tilting the furnace forward to cause the pool surface to rise above the tap hole and to effect injection of gas into the pool with stirring thereof, then back-tilting the furnace after a predetermined time of lancing, discontinuing flow of the gas and removing the lance from the tap hole in preparation for fusion-casting the pool.

3,752,896
METHOD AND APPARATUS FOR JOINING THE ELECTRODES OF AN ELECTROSLAG REMELTING SYSTEM

Erich Zimmermann, Hattingen-Blankenstein, and Nikolaus Forster, Dortmund-Brackel, both of Germany, assignors to Rheinstahl Huttenwerke AG, Essen, Germany

Filed Sept. 19, 1972, Ser. No. 290,371
Claims priority, application Germany, Oct. 16, 1971, P 21 51 617.6
Int. Cl. H05b *7/10*
U.S. Cl. 13—18 12 Claims

A method for joining the electrodes for electroslag remelting comprises arranging the electrodes in a feeding position in which they are fed downwardly one above the other relative to an ingot to be remelted and welding at least the core regions of the two electrodes together by subjecting them to currents of high intensity. An electrode feeding device comprises a vertical stand with first and second electrode holders on the stand which are independently vertically movable thereon. Each holder is insulated from the associated stand and from each other and from ground and it is provided with clamping means for clamping an electrode in a position in which its axis extends substantially vertically above the ingot to be remelted. During operation, the holders are moved vertically such that the electrode held by the uppermost holder is positioned into

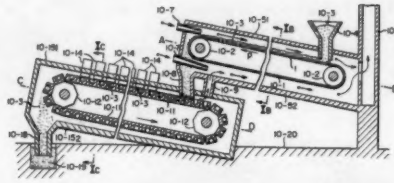


abutting contact with the top of the electrode held by the lowermost holder. The apparatus also advantageously includes a centering, packing and insulating ring which surrounds the space between the two abutting electrodes and which may advantageously be made with a funnel-shaped upper portion which may be filled with a slag.

3,752,897
DEVICE FOR MANUFACTURING IRON OR NON-ORE-SMELTING TYPE

Masami Atsukawa, 14-3, 2-chome, Tsukushino, Machida-shi, Tokyo, Japan

Filed June 17, 1971, Ser. No. 153,947
Int. Cl. F27b *9/12*; F27d *3/00*; H05b *3/60*
U.S. Cl. 13—20 17 Claims



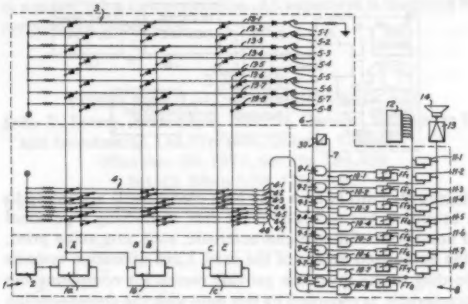
A device for manufacturing iron, in which by supplying an alternating current directly to the accumulation of a preheated iron-manufacturing raw material in the form of powder and particles a high-density current concentrated locally in the accumulation is formed. The reduction of iron oxide is carried out by applying Joule heat and electromagnetic force caused by the high density current to the raw material for manufacturing iron through which the current is flowing, thereby to soften a gangue material and simultaneously to aggregate iron particles, whereby in a non-ore-smelting state the iron in the form of a bare rod or particles is separated from the gangue material in the form of pumice.

3,752,898

ELECTRONIC MUSICAL INSTRUMENT

Nobuharu Obayashi, Shizuoka-ken, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Shizuoka-ken, Japan

Filed Apr. 4, 1972, Ser. No. 240,976
Claims priority, application Japan, Apr. 5, 1971, 46/20294; Apr. 6, 1971, 46/20712
Int. Cl. G10h 1/00
U.S. Cl. 84—1.01 4 Claims



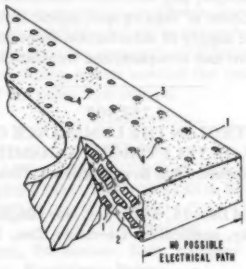
An electronic musical instrument having a simplified circuit arrangement intermediate the instrument key circuit and a control signal circuit, and including a pair of matrix circuits for connection through an array of switching and gate means of a speaker and amplifier.

3,752,899

SHIELDING AND GASKETING MATERIAL

Willem F. Bakker, Piscataway, N.J., assignor to Metex Corporation, Edison, N.J.

Filed May 25, 1970, Ser. No. 40,329
Int. Cl. H05k 9/00
U.S. Cl. 174—35 GC 12 Claims



An elastomeric matrix has an upper face and a lower face. Preferably a plurality of continuous unitary conductive layers is disposed within the matrix perpendicular to said face. A plurality of contact points are in contact with the conductive layer. The conductive layer is preferably expanded metal.

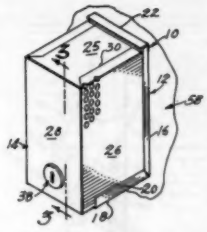
3,752,900

LOCKED THERMOSTAT BOX

Charles V. Harrison, 1894 Boulderview Dr. S.W., Atlanta, Ga., and William H. Higginbotham, 2080 Tilson Rd., Decatur, Ga.

Filed July 21, 1972, Ser. No. 274,084
Int. Cl. H05k 5/03
U.S. Cl. 174—52 R 7 Claims

A locked thermostat box for wall mounted thermostats including a cylindrical lock which cannot be opened except by the proper key. The cover for the box is a portion of the box itself and is easily removed after unlocking with the key providing access to the thermostat for adjustment. Basically the box is in two sections, one of which is mounted with the thermostat on the wall and the other which is the cover previously mentioned. The cover includes four sides of the box which are bent from a piece of sheet metal and the wall mounted portion of the box has two sides bent from a piece of sheet metal with marginal channels formed by turning-in a small portion of the edges to receive the edges of the cover.

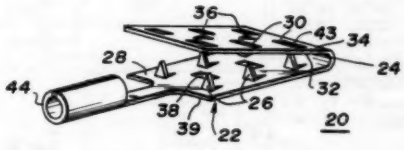


3,752,901

FOIL CONNECTOR

Lai Che Kuo, Elizabeth, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Aug. 23, 1971, Ser. No. 174,068
Int. Cl. H01r 11/08
U.S. Cl. 174—84 C 4 Claims



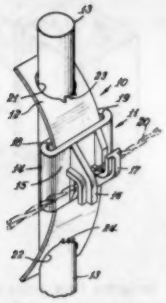
An electrical connector for engagement preferably with relatively thin conductive material comprising, in one embodiment, a pair of generally planar interengaging members matingly arranged in spaced, opposing relationship. Each of preferably a plurality of preferably tapered piercing members selectively disposed adjacent a first surface of at least one of said members is arranged to penetrate through thin conductive material interposed between said members and extend into and be deformed about an associated selectively proportioned transverse aperture in the mating member as said members are compressively urged against the intervening conductive material, to establish a secure connection therebetween. Each of the members may be provided with one or more extending portions for coupling the connector to a further conductor or support member. Other embodiments include a multiple of spaced, interengaging members similarly comprising selectively disposed transverse apertures and mating piercing members.

3,752,902

CLIP-TYPE ELECTRICAL FENCE INSULATOR

Robert M. Wilson, Battle Creek, Mich., assignor to Dare Products Incorporated, Battle Creek, Mich.

Filed Oct. 30, 1972, Ser. No. 302,294
Int. Cl. H01b *17/16*; A01k *3/00*
U.S. Cl. 174—163 F 15 Claims



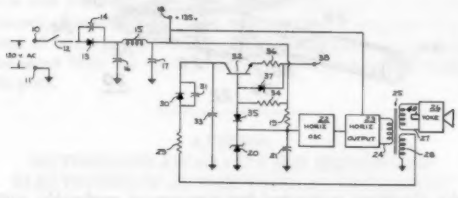
An electrical fence insulator comprising a spring clip with apertures adapted to engage a fence post and a body member of a plastic material having electrical wire engaging hooks, and a channel engaging the spring clip.

3,752,903

PILOT VOLTAGE SUPPLY & VOLTAGE REGULATION MEANS

Robert H. Newman, Norfolk, and Mervyn M. Pluck, Portsmouth, both of Va., assignors to General Electric Company, Portsmouth, Va.

Filed Nov. 8, 1971, Ser. No. 196,267
Int. Cl. H04n *5/44*
U.S. Cl. 178—7.5 R 3 Claims



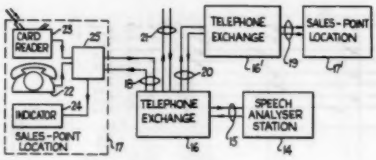
Means for energizing an oscillator, and for regulating a voltage derived from the oscillator output. A pilot voltage is developed across a zener diode and applied to an oscillator, and to the base of a regulating transistor by means of a reverse-poled diode. Unregulated voltages are applied to the cathode of the zener diode and to the base of the regulating transistor. The pilot voltage arising across the zener diode energizes the oscillator which drives circuitry for producing scansion signals to deflect an electron beam within a cathode ray tube. The scansion signals are also applied to the collector of the regulating transistor after being rectified and smoothed. The regulating transistor is controlled by a base voltage derived across the zener diode and uses the rectified scansion signal voltage to produce a relatively low-impedance, regulated DC voltage at the emitter terminal thereof.

3,752,904

CREDIT AND OTHER SECURITY CARDS AND CARD UTILIZATION SYSTEM THEREFOR

Nelson J. Waterbury, Palm Beach, Fla., assignor to Cynthia Cannon, London, England and Louis Beck, New York, N.Y., part interest to each

Filed Aug. 9, 1971, Ser. No. 169,906
Int. Cl. H04n *1/44*
U.S. Cl. 178—5.1 22 Claims



A security card (which may be a credit card) according to the invention has recorded on it data identifying a personal and non-counterfeitable characteristic, such as a voice print, of the authorised holder of the card. Card utilisation systems according to the invention provide means for comparing the characteristic as recorded by this data with the corresponding characteristic of the person wishing to use the card, thereby substantially eliminating the possibility of unauthorised use of the card. The system, when applied to credit card utilisation, preferably includes document facsimile transmission, whereby a credit card user obtaining credit remotely can be provided with a facsimile copy of the usual credit sale document, which facsimile copy he signs before transmitting another facsimile copy, this time of the signed first copy, to provide the remote credit issuing location with his authentication of the transaction.

Preferably, also, the system includes provision for television communication between credit card holders and the credit-giving locations, whereby, for example, a remote would-be purchaser can be shown goods in which he is interested.

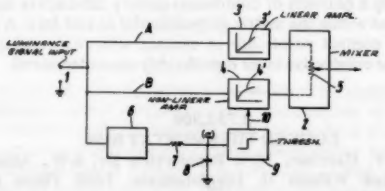
The system is also adapted to provide for credit card payment in, for example, pay television distribution systems and for remote purchase of theatre and airline tickets and of services such as the supply of information from computerised information systems and computerised translation services.

3,752,905

GAMMA CONTROL IN THE LUMINANCE CHANNEL OF A COLOR TELEVISION TRANSMITTER

Hans-Dieter Schneider, Am Bruckelchen 6, Gross-Gerau, Germany

Filed Dec. 15, 1971, Ser. No. 208,337
Claims priority, application Germany, Dec. 16, 1970, P 20 61 952.7
Int. Cl. H04n *9/53*
U.S. Cl. 178—*5.4* R 12 Claims



The invention relates to a method and apparatus for transmitting a television picture signal having a high contrast range. The method involves integrating at least a portion of the television picture signal to obtain a test signal. The test signal is sensed by a threshold circuit which generates a control signal when the test signal approaches or exceeds a threshold

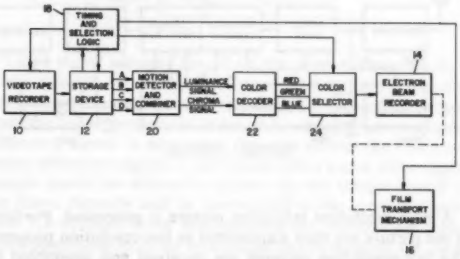
level. The television picture signal is also simultaneously transmitted through two parallel channels, one channel including a linear amplifier and the other channel including a gamma amplifier having a changeable gain characteristic. The control signal, generated in response to the test signal exceeding the threshold level, modifies the gain characteristic of the gamma amplifier to increase the amplification of the signal corresponding to the picture in the shaded areas and reducing the amplification of the signal corresponding to the picture in the light areas. The output of the two channels are then combined in a mixer prior to transmission. An apparatus is disclosed for carrying out the method.

3,752,906

VIDEO-TO-FILM CONVERSION PROCESS

John D. Lowry, Willowdale, Ontario, Canada, assignor to Elain Investments, Ltd., Toronto, Ontario, Canada

Filed Dec. 20, 1971, Ser. No. 209,859
Int. Cl. H04n *5/78, 5/84, 9/02*
U.S. Cl. 178—5.4 CD **10 Claims**



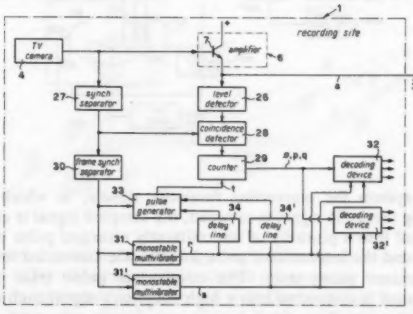
A color videotape-to-film conversion process uses a random-access storage medium to store a group of color image fields. Selected stored image fields are then repeatedly retrieved for the successive decoding and recording of the primary colors. For each color, the retrieved fields are combined in varying order for noise reduction, frame rate conversion, and luminance-chroma separation. The monochromatic combined fields are then recorded on film in pairs as monochromatic frames, with a full blank field between frames to provide adequate time for film advance and precision registration. Internally clocked timing means control the storage, selection, and retrieval of the video tape signals.

3,752,907

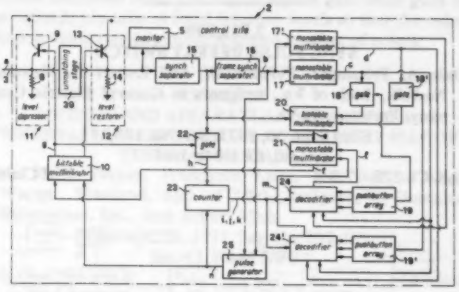
METHOD AND APPARATUS FOR TRANSFERRING COMMANDS FROM THE CONTROL SITE TO THE RECORDING SITE IN CLOSED LOOP TELEVISION INSTALLATIONS

Lamberto Mazza, Pordenone, Italy, assignor to Industrie A. Zanussi S.p.A., Pordenone, Italy

Filed Mar. 19, 1971, Ser. No. 126,160
Int. Cl. H04n *1/32*
U.S. Cl. 178—5.6 **21 Claims**



A method and an apparatus for transferring commands from the control site of a closed loop TV circuit to the recording site, said method essentially consisting in the steps of selecting a predetermined number of line-synchronizing pulses from the video signal for each command starting from the control site, the pulses so selected being impressed to the recording site and counted the counted number being converted into a signal whose magnitude and destination are a function of said counted number. The advantage of the invention is that additional command-transferring lines can be actually dispsned with, the usual coaxial cables being generally sufficient to the above specified purpose.

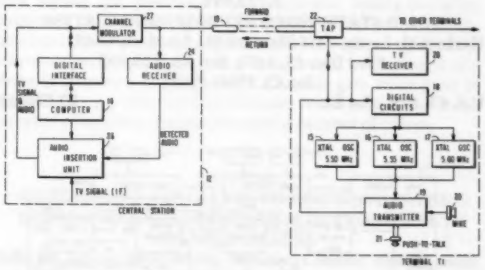


3,752,908

CATV AUDIO INTERACTION SYSTEM

Clyde A. Boenke; Ronald L. Reimink, and James A. Jackson, all of Ann Arbor, Mich., assignors to KMS Industries, Inc., Ann Arbor, Mich.

Filed June 28, 1972, Ser. No. 266,923
Int. Cl. H04n *7/14*
U.S. Cl. 178—5.6 **9 Claims**



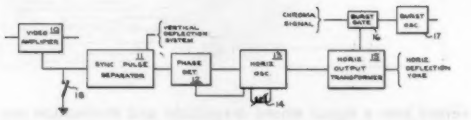
A central station including a computer is connected via a multi-channel CATV cable to a plurality of remote terminal stations. Some of the channels are reserved for commercial television programs. However, a predetermined number of forward television channels are reserved for private television programs which may be generated either at the central station and transmitted on these forward channels to selected terminal stations under the control of the computer, or else a private TV program may be originated at one of the remote terminals, transmitted via the cable on a return television channel thereof to the central station, and then retransmitted from the central station via the cable on a forward television channel thereof to selected remote terminal stations under the control of the computer. Each terminal station contains an audio input means, such as a microphone and an audio transmitter, for permitting a return audio or speech signal to be inserted at the central station upon the audio subcarrier of television signal which is being received by the other remote terminal stations. For a given television channel, all terminal stations use the same audio return channel, thereby communicating in a party line mode. In one embodiment, the return audio carriers for the private television channels are generated at each terminal station and the audio interaction is provided

by a novel audio insertion unit using a phase locked loop which does not require demodulation and remodulation of the video signal. In another embodiment of the invention, the audio carriers for the return audio channels are generated at the central station and transmitted to the terminals for modulation by the respective return audio inputs.

3,752,909
SYNC PULSE DEFEAT SWITCH

Dale A. Fritzinger, Portsmouth, and Robert H. Newman, Norfolk, both of Va., assignors to General Electric Company, Portsmouth, Va.

Filed Sept. 30, 1971, Ser. No. 185,191
Int. Cl. H04n 5/44
U.S. Cl. 178—7.3 R **2 Claims**

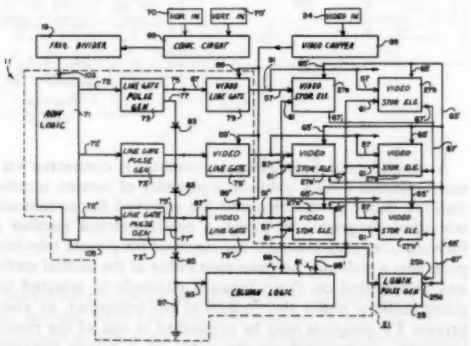


Switch means are provided in a circuit for defeating the application of sync pulses simultaneously with the adjustment of a horizontal oscillator. The switch comprises a pair of upstanding conductive elements disposed adjacent one end of a slug-tuned coil. Adjusting means operable from without the receiver cabinet extend through the slug-tuned coil to the vicinity of the switch elements. The adjusting means are pushed inwardly from without the receiver cabinet to cause the switch to close, defeating the sync pulses. While in this extended position the adjusting means may be turned to modify the characteristics of the slug-tuned coil, while operation of the oscillator circuit continues unhampered by the presence of sync pulses.

3,752,910
SOLID STATE VIDEO REPRODUCING SYSTEM

Herbert H. Lewis, 7314 Stanford St., La Mesa, Calif.

Filed Dec. 13, 1971, Ser. No. 206,992
Int. Cl. H04n 9/30
U.S. Cl. 178—5.4 EL **22 Claims**

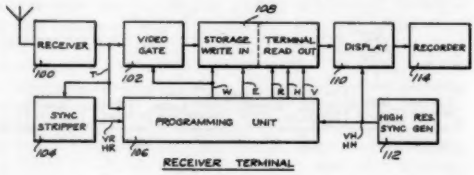


A system employing a solid state electroluminescent display panel having a plurality of light emissive elements, e.g., light emissive transistors, and other micro-electronic components deposited thereon. The system includes structure for sequentially and selectively controlling the range of various voltages which are applied to the plurality of light emissive elements to reproduce black and white television signals, color television signals, or other analog or digital information. The system also includes a plurality of memory circuits which permits the storage of a complete frame or field of television information. The system additionally includes a pulse generator which produces a pulse at the end of each frame, or field in interlaced scanning, causing a visual presentation on the display panel of the stored video signal information. The system utilizes a video chopper circuit to provide numerous bits of a signal, e.g., the video signal. The bits individually are of various amplitudes and have a uniform pulse width but collectively envelop the changing amplitude of the video signal for a complete field or frame.

3,752,911
HIGH RESOLUTION TELEVISION TRANSMISSION

Charles A. Morchand, New York, and Don J. Dudley, Brightwaters, both of N.Y., assignors to Data-Plex Systems, Inc., New York, N.Y.

Filed June 18, 1971, Ser. No. 154,406
Int. Cl. H04n 7/08
U.S. Cl. 178—6.8 **7 Claims**

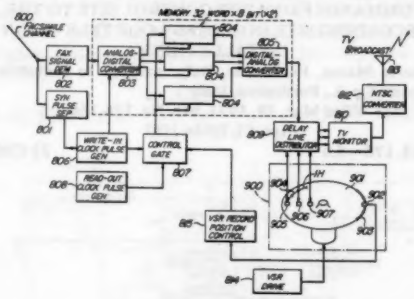


A high-resolution television picture is generated. Portions of the picture are then transmitted as low-resolution pictures. The low-resolution pictures are received and assembled to reform the high-resolution picture.

3,752,912
SYSTEM FOR CONVERTING FACSIMILE SIGNALS

Hiroji Ohsawa, Kamakura; Kazuo Enosawa, Matsudo; Heijiro Hayami, Takatsuki, and Kaoru Sasabe, Ikeda, all of Japan, assignors to Nippon Hoso Kyokai, Tokyo and Matsushita Electric Industrial Co., Ltd., Kadoma-shi, Osaka, Japan

Filed Nov. 23, 1970, Ser. No. 91,656
Claims priority, application Japan, Nov. 27, 1969, 44/96054; Nov. 28, 1969, 44/96379
Int. Cl. H04n 7/12
U.S. Cl. 178—6 **8 Claims**

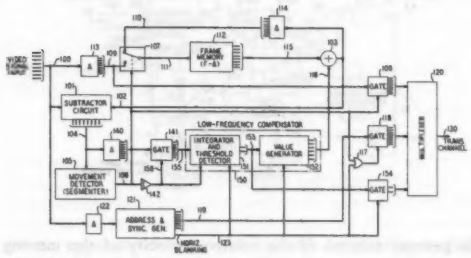


A system for converting facsimile signals, in which an analog facsimile signal is sampled, the sampled signal is compressed into a plurality of intermittently arranged pulse bundles, and the intermittent pulse bundles are converted into a continuous pulse train. The continuous pulse train thus produced is converted into a high frequency signal such as a television signal.

3,752,913
CONDITIONAL REPLENISHMENT VIDEO ENCODER WITH LOW-FREQUENCY COMPENSATION

Denis John Connor, John Ormond Limb, both of New Shrewsbury, and Kenneth Allen Walsh, Matawan, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 14, 1972, Ser. No. 262,678
Int. Cl. H04n 7/12
U.S. Cl. 178—6 15 Claims

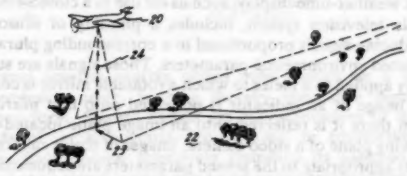


Video signal samples for all of the picture elements in a frame interval are stored in a frame memory and each new video signal sample is compared with its corresponding sample from the frame memory in order to develop a frame-to-frame difference signal. A movement detector utilizes the frame-to-frame difference signals to determine when a new video signal sample should be utilized to update the old sample stored in the frame memory and be transmitted to the receiving location. An address word accompanies the transmitted video signal amplitude in order to indicate to the receiver the location of the amplitude within the frame interval. Frame-to-frame differences not indicated as belonging to a moving area are integrated for an entire video line interval. If the integration result exceeds a predetermined threshold, indication of this fact is transmitted to the receiver during the horizontal blanking interval. In addition, a compensation value is developed in response to this indication, and this value is utilized during the next video line interval to modify all of the picture element amplitudes stored in the frame memory for that video line interval. As a result, stored picture element amplitudes are changed en masse for an entire line interval in response to low-frequency changes of the type which occur as a result of changes in light intensity.

3,752,914
METHOD AND APPARATUS FOR MAKING A COLOR STRIP MAP OF THERMAL VARIATIONS

George England, Detroit, and Dwight Allen Warner, Westland, both of Mich., assignors to Daedalus Enterprises, Inc., Ann Arbor, Mich.

Filed Nov. 26, 1971, Ser. No. 202,552
Int. Cl. H04n 5/84
U.S. Cl. 178—6.7 R 13 Claims

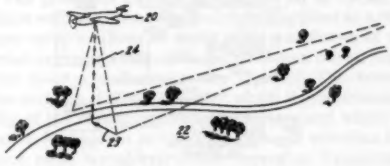


Thermal ground data and thermal reference data acquired by an airborne scanner are recorded on magnetic tape along with timing signals synchronized with the scanning. At some later time, the signals are played back and processed to produce a color image on a line-scanned cathode ray tube and the image is recorded on a continuous color film strip. Ground data signals are processed by a particular analog-to-digital converter to provide signals according to the instantaneous level of the thermal ground data compared to discrete reference levels which in turn are calibrated according to the thermal reference data. The digital signals gate color guns in the cathode ray tube at fixed intensity levels so that the color image is composed of a predetermined number of colors.

3,752,915
METHOD AND APPARATUS FOR MAKING A TEMPERATURE-REFERENCED COLOR STRIP MAP OF THERMAL VARIATIONS

Alan Keith Parker, Whitmore Lake, and Dwight Allen Warner, Westland, both of Mich., assignors to Daedalus Enterprises, Inc., Ann Arbor, Mich.

Filed Nov. 26, 1971, Ser. No. 202,461
Int. Cl. H04n 5/84
U.S. Cl. 178—6.7 R 17 Claims

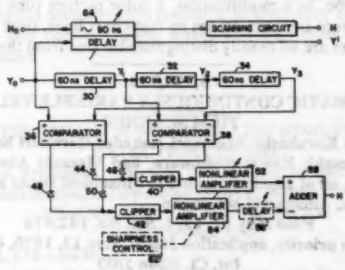


Thermal ground data and thermal reference data acquired by an airborne scanner are recorded on magnetic tape along with timing signals synchronized with the scanning. At some later time, the signals are played back and processed to produce a color image on a line-scanned cathode ray tube and the image is recorded on a continuous color film strip. Ground data signals are processed by a particular analog-to-digital converter to provide digital signals according to the instantaneous level of the thermal ground data compared to discrete reference levels which in turn are calibrated according to the thermal reference data. The digital signals gate color guns in the cathode ray tube at fixed intensity levels so that the color image is composed of a predetermined number of colors.

3,752,916
METHOD AND APPARATUS FOR IMPROVING THE HORIZONTAL SHARPNESS OF ELECTRONICALLY SCANNED IMAGES

John D. Lowry, Willowdale, Ontario, Canada, and Kenneth F. Holland, Granada Hills, Calif., assignors to Ellanin Investments, Ltd., Toronto, Ontario, Canada

Filed Sept. 30, 1971, Ser. No. 185,157
Int. Cl. H04n 3/16, 5/84
U.S. Cl. 178—7.3 R 15 Claims



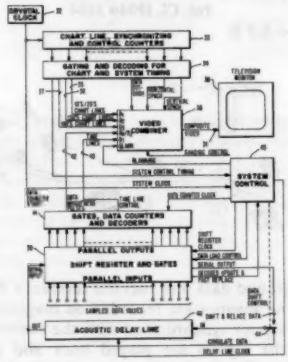
Superior sharpness at interface between low-and high-intensity image areas of an electronically scanned image is obtained

by controlling the scan speed of the beam in addition to, and in accordance with changes in, its intensity. The scan speed variation signal is produced by time-delaying and mathematically processing the incoming intensity signal. In the preferred embodiment, the scan speed variation signal is superimposed upon the linear horizontal scan signal by applying it to an extra push-pull-connected pair of horizontal deflection plates.

3,752,917
CATHODE RAY TUBE SYSTEM WITH STRIP CHART RECORDER DISPLAY FORMAT

Gerard M. Foley, Ambler, and Gerard Mosley, Melrose Park, both of Pa., assignors to Leeds & Northrup Company, North Wales, Pa.

Filed Oct. 7, 1971, Ser. No. 187,300
Int. Cl. H04n *7/18*
U.S. Cl. 178—6.8 **17 Claims**



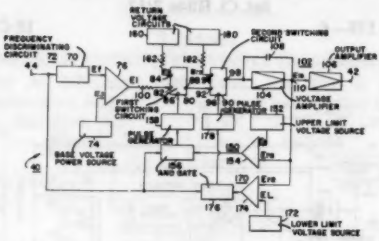
A time variant measured variable is graphically displayed in moving strip chart format on a cathode ray tube. During a scan line the electron beam is intensity modulated at a position on the scan line which represents the magnitude of the measured variable at a given time. The intensity of the electron beam at positions in successive scan lines is similarly intensity modulated to produce a trend line representing the magnitude of the variable along the strip chart format. During the scanning of a subsequent raster frame, a new data value of the measured variable is displayed at a selected position at an edge of the viewing area of the strip chart format in the location previously occupied by the next sequential value and the older data values are simultaneously displaced. The oldest data value is deleted from the format. During a raster scan the electron beam is modulated at different intensity levels to produce chart lines and time lines on the strip chart format. During each scan line the electron beam may be turned on between a reference position and the position at which the measured variable is recorded to produce a shaded trend line more readily distinguished from other trend lines on the face of the tube. In a modification, a color picture tube produces the different intensity traces so that chart lines, time lines and trend lines are all readily distinguishable one from the other.

3,752,918
AUTOMATIC CONTINUOUSLY VARIABLE VELOCITY FILM SCANNER

Koichiro Kurahashi; Masanori Nakada; Harunori Sato, all of Amagasaki; Koichi Nishimura, and Masaaki Abe, both of Kyoto, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Amagasaki-shi, Japan

Filed May 12, 1971, Ser. No. 142,474
Claims priority, application Japan, May 13, 1970, 45/40816
Int. Cl. H04n *5/00*
U.S. Cl. 178—7.2 **18 Claims**

An apparatus for reproducing stored video information, recorded on a continuously moving recording medium is disclosed. A flying spot for scanning the recording medium is deflected along a first line which is perpendicular to the direction of movement of the recording medium and is also deflected along a second line which is parallel to the direction of movement of the medium. The deflection along the second

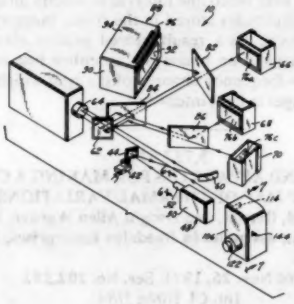


line permits control of the relative velocity of the moving recording medium with respect to the flying spot. As the result, it enables making stable reproductions of video informations, slow motion reproductions, still-reproductions, accelerated-motion reproductions and the like regardless of the velocity of the recording medium.

3,752,919
WEATHER TIME DISPLAY

Maqbool Qurashi, Pennsauken, N.J., and Lincoln W. Faries, Richboro, Pa., assignors to Jerrold Electronic Corporation, Hatboro, Pa.

Filed Aug. 19, 1971, Ser. No. 172,987
Int. Cl. H04n *5/22, 7/18*
U.S. Cl. 178—7.88 **17 Claims**

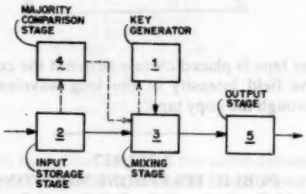


A weather-time display, such as for use in a closed-circuit of cable television system, includes a plurality of sensors for producing signals proportional to a corresponding plurality of selected environmental parameters. Those signals are sequentially applied to a meter to which a rotatable mirror is coupled. An image of an indicator is projected onto that mirror and from there it is reflected onto an image plane located at the viewing plane of a video camera. Images of scales calibrated in units appropriate to the sensed parameters are sequentially superimposed with the image of the indicator at the image plane such that sequential composite images of the scales and the indicator are formed for viewing and transmission by the video camera. If desired, and as herein shown, an image of the time may also be superimposed on the composite scale-indicator image at the image plane.

3,752,920
APPARATUS FOR ENCIPHERING AND DECIPHERING MULTIDIGIT CODED SIGNALS

Bruno Gemperle, Steinhausen, Switzerland, assignor to Anstatt Europaische Handelsgesellschaft, Vaduz, Liechtenstein

Filed July 28, 1971, Ser. No. 166,810
Claims priority, application Switzerland, Aug. 20, 1970, 12497/70
Int. Cl. H04l 9/04
U.S. Cl. 178—22 2 Claims

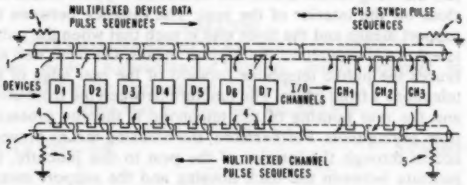


An apparatus for enciphering and deciphering multidigit coded signals, comprising a key generator and an input storage, both said key generator and input storage being connected with a mixing stage. The mixing stage serves to couple in character element fashion signals delivered from the input storage with signals delivered from the key generator. This input storage contains a first storage stage with a number of individual stores in which there can be stored in character element fashion a number of successive signals corresponding to the number of individual stores. A comparison detector responds to the majority of the similar type character elements of the same digit or place value recorded at the individual stores by producing a majority signal. This detector is connected with the second storage stage of the input storage and said second storage stage receives the majority signal produced by the individual stores of the first storage stage.

3,752,921
DISTINCT COMPLEX SIGNALS FORMED BY PLURAL CLIPPING TRANSFORMATIONS OF SUPERPOSED ISOCHRONAL PULSE CODE SEQUENCES

Leo M. Audretsch, Jr., and Matthew Elsner, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 4, 1970, Ser. No. 86,688
Int. Cl. H04j 1/00
U.S. Cl. 179—15 BC 8 Claims

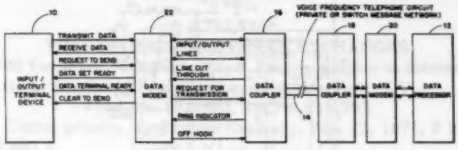


Signal sources overlay coded pulse signals on a tapped transmission cable, forming thereby composite signals of unique form. Source signals are representations of distinct words of an orthogonal, biorthogonal or transorthogonal code. Each source selectively transmits its assigned code signal or no signal in each of a series of isochronous time intervals. The source signals are adjusted in phase and amplitude to equalize delay and attenuation effects in relation to receiving terminals. Composite signals are handled further in a clipped digital form in which the intelligence of the composite is singularly retained. At receiving terminals the clipped composite is analyzed by digital matched filter circuits.

3,752,922
CRYSTAL CONTROLLED FREQUENCY SHIFT KEYING SYNCHRONOUS GENERATING SYSTEM

Nelson W. Burke, Stoneham, Mass., assignor to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Dec. 9, 1971, Ser. No. 208,044
Int. Cl. G08c 19/14
U.S. Cl. 178—66 R 31 Claims

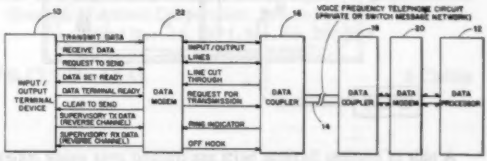


An FSK transmitter includes a crystal controlled generator which includes a counter which when cycled provides a number of output signals which are logically combined to produce pulse waveforms having different repetition frequencies. The generator counter is arranged to be cycled in accordance with the state of bilevel signals applied to a plurality of input selection lines to apply pulse waveforms of the appropriate repetition frequencies to an output circuit for transmission over a communications channel. The transmitter further includes a ramp generator which is synchronized with cycling of the crystal controlled generator and which is also operative in response to the state of input selection lines to produce pulse waveforms whose repetition frequencies approximate those produced by the crystal controlled generator. During a shift in frequency, the transmitter uses the ramp generator waveforms to establish the cycle time of the counter so as to provide a nominal time period for the pulse waveforms being applied to the output circuit during the time of frequency shift thereby minimizing distortion of the waveforms at the time of crossover.

3,752,923
FREQUENCY SHIFT KEYED GENERATING SYSTEM

Nelson W. Burke, Stoneham, Mass., assignor to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Dec. 9, 1971, Ser. No. 208,045
Int. Cl. H03c 3/02
U.S. Cl. 178—66 R 28 Claims



A transmitter produces a plurality of frequencies for application to a communications channel by generating a number of triangular waveforms in response to a plurality of selection signals and converts these waveforms into their respective frequencies.

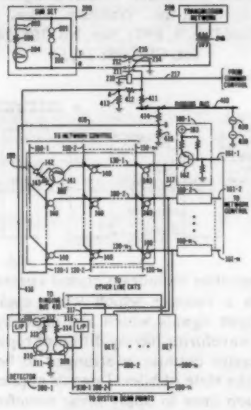
3,752,924
TELEPHONE SUBSCRIBER LINE RING-TRIP DETECTION CIRCUIT

Laimons Freimanis, Chicago, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 10, 1971, Ser. No. 197,471
Int. Cl. H04m 19/02
U.S. Cl. 179—84 R 12 Claims

A ring-trip detection circuit arrangement for telephone system subscriber lines in which a relatively small number of detection circuits serve a large number of subscriber lines. Intended to overcome one of the problems presented by the ina-

bility of the transformer-coupled switching network to pass direct current, the invention provides for the assignment of the detector circuits to called lines by means of an auxiliary



concentrator network. The necessity of providing the circuits on a per-line basis is eliminated.

3,752,925

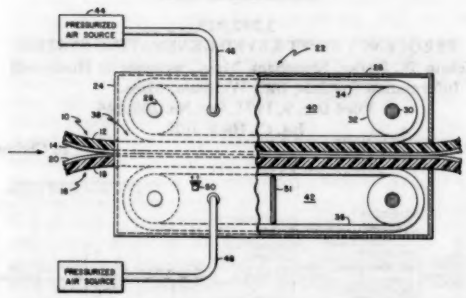
APPARATUS FOR HOLDING MAGNETIC TAPES IN INTIMATE CONTACT

Philip Smaler, 4155 Wilkie, Palo Alto, Calif.

Filed Oct. 1, 1971, Ser. No. 185,613

Int. Cl. G11b *5/86, 15/43, 15/38*

U.S. Cl. 179—100.2 E **9 Claims**



A pair of endless flexible belts are trained over guide rollers so that opposing faces of the guide belts form a squeeze passage for master and copy magnetic tapes. Plates extending along edges of the belts form chambers in combination with them. The chambers are pressurized to expand the belts against one another and hold the tapes in intimate non-slipping contact with a substantial uniform force. A magnetic head positioned in one of the pressure chambers biases the copy tape to enable a direct contact transfer recording of magnetic signals from the master to the copy tape.

3,752,926

LONG WAVELENGTH SIGNAL ENHANCEMENT FOR CONTACT MAGNETIC TRANSFER RECORDING

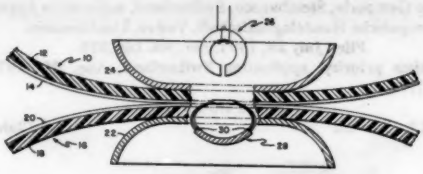
Philip Smaller, 4155 Wilkie, Palo Alto, Calif.

Filed Oct. 28, 1971, Ser. No. 193,451

Int. Cl. G11b *5/86*

U.S. Cl. 179—100.2 E **9 Claims**

A master and a copy tape are placed in slippage-free contact and the copy tape is sensitized to receive the magnetic signals from the master tape. A bar having high permeability and generally conforming to the magnetic lines of force from



the master tape is placed closely adjacent the copy tape to increase the field intensity of the long wavelength magnetic signals through the copy tape.

3,752,927

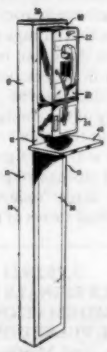
PUBLIC TELEPHONE MOUNTING

Keith David Bartley, and Fred Arlington Dewhirst, both of Indianapolis, Ind., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 28, 1972, Ser. No. 267,053

Int. Cl. H04m *1/11*

U.S. Cl. 179—146 R **10 Claims**



The telephone mounting comprises a tubular post including front and back walls spaced from one another. The front wall of the post has an opening therein that conforms to the peripheral configuration of the public telephone for which the mounting is adapted. In addition, the interior of the post includes support means to which the public telephone is secured and blocking means above and below the support means that close off the interior of the post. The distance between the support means and the front wall is such that when the public telephone is secured to the support means, the front wall embraces the public telephone forward of the rear edge of the telephone's front cover. The juncture between the front cover and the rear housing of the telephone is thereby protected from prying tools. Furthermore, the blocking means prevents access through the interior of the post to this juncture, the juncture between the back housing and the support means, and the fasteners used to secure the telephone to the support means.

3,752,928

AMPLIFIER SYSTEM UTILIZING REGENERATIVE AND DEGENERATIVE FEEDBACK TO SHAPE THE FREQUENCY RESPONSE

Daniel N. Flickinger, 40 S. Oviatt St., Box 628, Hudson, Ohio

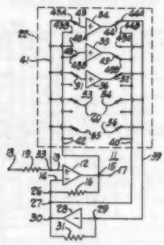
Filed Mar. 4, 1971, Ser. No. 120,875

Int. Cl. H03j *5/24*

U.S. Cl. 179—1 A **16 Claims**

An amplifier system is disclosed having a plurality of frequency sensitive band amplifiers to shape the frequency

response of the amplifier system. The band amplifiers use active filters to amplify or attenuate sections of bandwidth of the amplifier system and band amplifiers are only required for the sections of the bandwidth to be altered. The amplifier system is suitable for use with an audio amplifier system to reinforce



or attenuate the acoustical output of the audio system to compensate for speaker performance and room acoustics. The foregoing abstract is merely a resume of one general application, is not a complete discussion of all principles of operation or applications, and is not to be construed as a limitation on the scope of the claimed subject matter.

3,752,929

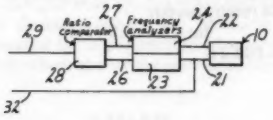
PROCESS AND APPARATUS FOR DETERMINING THE DEGREE OF NASALITY OF HUMAN SPEECH

Samuel G. Fletcher, 1919 7th Ave. South, Birmingham, Ala.

Filed Nov. 3, 1971, Ser. No. 195,392

Int. Cl. G10l 1/04

U.S. Cl. 179—1 SA **2 Claims**



A process and apparatus is described in which electric signals representative of the sounds emitted from the nose and mouth are utilized to determine the degree of nasality of speech. Separate electric signals are derived from sounds emitted from the nose and mouth and these are compared one to the other and then the resultant signal is compared with a signal representative of a known degree of nasality. A form of apparatus suitable for carrying out the process is disclosed, including means separately to impress the nasal and oral signals onto separately functioning microphones.

3,752,930

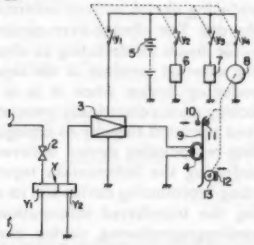
TELEPHONE SPEECH RECORDING DEVICE

Shizoo Ando, Kalsushika-ku, Tokyo, Japan, assignor to Pioneer Electric Corporation, Tokyo, Japan

Filed May 5, 1972, Ser. No. 250,549

Int. Cl. H04m 1/64

U.S. Cl. 179—6 R **3 Claims**



A telephone recorder including a single relay having two windings. The first winding is connected in series with the telephone and the telephone line. Since there is no d.c. path through the first winding until the telephone receiver is picked up, telephone call or ringing signals do not operate the relay. However, when the receiver is picked up, the relay is energized to close contacts to initiate operation of the recorder. Speech signals on the telephone line pass through the first relay winding and are induced into the second relay winding which is connected to the recording amplifier of the recorder.

3,752,931

TIME DIVISION MULTIPLEX EXCHANGES

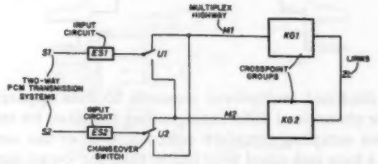
Willi Verstegen, Meudon La Foret, France, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 19, 1972, Ser. No. 218,992

Claims priority, application Germany, Feb. 22, 1971, P 21 08 407.1

Int. Cl. H04j 3/00

U.S. Cl. 179—15 AQ **5 Claims**



A TDM system is disclosed for use in multiplex exchanges in which trunk groups are divided into partial groups via switching devices which connect them to crosspoint groups. The switching devices are operated at the system clock rate, thereby eliminating the need for an address memory. The switching-devices, by dividing the trunk groups into partial groups connected to various crosspoint groups enable a larger percentage of traffic to be switched within the crosspoint groups and thus reduce the need for links between crosspoint groups. Each crosspoint group is wired with the same number of partial groups, so that in case of total failure of a crosspoint group, traffic in all directions is still possible.

3,752,932

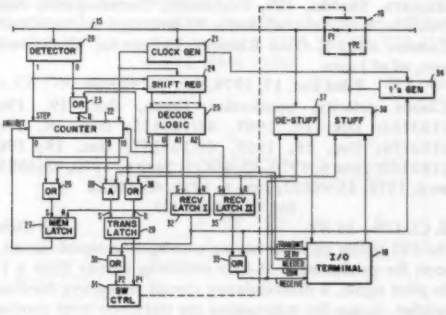
LOOP COMMUNICATIONS SYSTEM

John Batista Frisone, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 14, 1971, Ser. No. 207,864

Int. Cl. H04q 5/00

U.S. Cl. 179—15 AL **6 Claims**

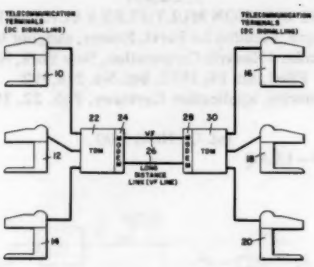


A communications system including a central station connected in a series loop with a plurality of remote stations and in which under control of said central station, the remote stations in the order of their physical position transmit data to the central station.

3,752,933
BIT REGENERATION FOR TIME DIVISION MULTIPLEXERS

Peter J. Cohen, Stony Brook, and Philip W. Ackerman, Smithtown, both of N.Y., assignors to Databit Incorporated, Hauppauge, N.Y.

Filed Jan. 6, 1972, Ser. No. 215,781
Int. Cl. H04j 3/16
U.S. Cl. 179—15 BA **11 Claims**



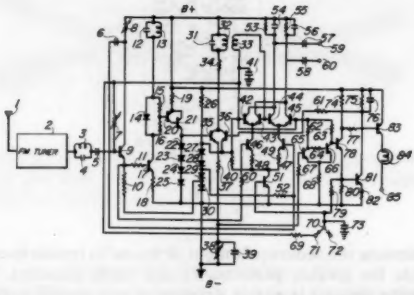
The disclosed multiplexer responds to data appearing on separate channels at different signalling speeds or bit rates. At least two sampling rates are selected. One of the sampling rates is a base rate equal to or higher than the lowest signalling speed and the other sampling rate is a multiple of the base rate equal to or higher than the fastest signalling speed. The lowest speed signals are sampled at the base rate and the higher speed signals with the higher rate. The resulting sampled data is then interleaved. The lowest bit rate occupies the normal number of slots and the higher bit rate occupies a multiple number of the low rate slots. The interleaved signals are then transmitted. To accommodate telex call-establishing signals, which may occur in the same channel at rates different from the data rate, the existence of such call-establishing signals is determined and the sampling times are adjusted. The sampled signals are regenerated into bits which are multiples of the data rate. These bits are interleaved as data. Within the multiplexer distortion is removed by regenerating the signals in each channel on the bais of the condition of the center of each bit. This is comparable to a repeater. The bit center is located by high speed sampling techniques which count to the center of each bit on the basis of predetermined programs which are preset in accordance with the expected bit rate in each channel.

3,752,934
STEREO DEMODULATING CIRCUIT TRIGGERED BY A MINIMUM INPUT SIGNAL LEVEL

Nakamura, Shoichi, 408, Fushimido, Tondabayashi; Nada, Naohiro, 4-15, Sakuradanicho, Nishinomiya-shi, and Okubo, Tsuneo, 1642-7, Oaza Kisaichi, Katanocho, Kitakawachi-gun, all of Japan

Filed Dec. 17, 1970, Ser. No. 99,069
Claims priority, application Japan, Dec. 19, 1969, 44/103154; Dec. 19, 1969, 44/103155; Dec. 19, 1969, 44/103156; Dec. 19, 1969, 44/103157; Dec. 19, 1969, 44/103158; June 6, 1970, 45/48819; June 6, 1970, 45/48820; June 6, 1970, 45/48821; June 6, 1970, 45/48822
Int. Cl. H04h 5/00
U.S. Cl. 179—15 BT **18 Claims**

An FM stereo receiver having a composite signal circuit, a circuit for producing a 38-kHz switching carrier from a 19-kHz pilot signal, a demodulating circuit, a positive feedback amplifier, means for maintaining the stereo-on level constant irrespective of any variation in the power supply voltage and ambient temperature, means connected to the positive feedback amplifier for turning on and off a stereo lamp while, at the same time, turning on and off the 38-kHz switching carrier, and means for applying a first composite signal of one phase and a second composite signal of opposite phase to a first and a second composite signal amplifier in the demodulating circuit respectively and varying the level of the input to

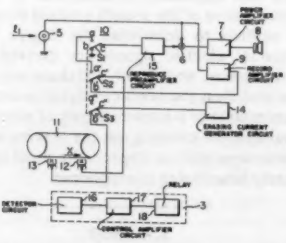


the second composite signal amplifier for improving the stereo separation.

3,752,935
AUTOMATIC SWITCH DEVICE FOR MAGNETIC RECORDING AND REPRODUCING DEVICE

Yasutaka Iwawaki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 6, 1971, Ser. No. 104,433
Claims priority, application Japan, Jan. 20, 1970, 45/6014 (utility model); Jan. 27, 1970, 45/8453 (utility model); Jan. 27, 1970, 45/8454 (utility model)
Int. Cl. G11b 15/02
U.S. Cl. 179—100.2 S **3 Claims**

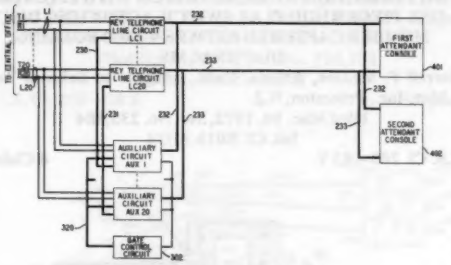


An automatic change-over mechanism for a magnetic recording-reproducing device which contains therein an endless magnetic recording medium and which may be additionally connected with a separate conventional magnetic recording-reproducing device without reforming the interior construction thereof. The change-over mechanism basically comprises detector means for detecting an electrical variation appearing at the external terminal of the separate magnetic recording-reproducing device when it is in its reproduce mode, and switching means electrically associated with the detector means and operated thereby to change over the connected recording-reproducing device between its operation mode for transferring the information reproduced by the separate recording-reproducing device and its operation mode for reproducing the transferred information, whereby the magnetic recordinggreproducing device connected to the separate one may be auotmatically operable to repeatedly reproduce the transferred information after the separate device has been stopped from its reproducing operation.

3,752,936
KEY TELEPHONE CALL DISTRIBUTING SYSTEM

Charles Ernest Morse, Holmdel, N.J., assignor to Bell Telephone Laboratories, Murray Hill, N.J.

Filed May 30, 1972, Ser. No. 258,106
Int. Cl. H04m 3/22
U.S. Cl. 179—99 7 Claims

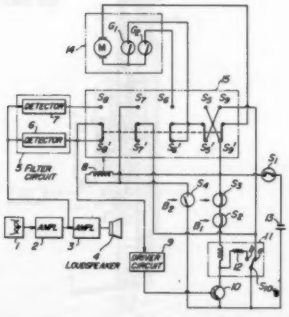


The circuitry of a standard key telephone system is modified to serve as a call distributing system. A gate circuit, associated with the key telephone line circuits, is arranged to establish a first timed interval during which all incoming connections to the station are processed in a manner such that the associated line lamp at the key telephone station provides a first visual indication. The line lamps associated with incoming connections arriving at the conclusion of the first timed interval are arranged to provide a second mode distinctive visual indication. When all of the first mode lines are answered, the second mode lines are switched to the first mode and the associated line lamps are changed from second mode distinctive flashing to first mode flashing. When any incoming connection remains unanswered for a predetermined interval, a special announcement is returned over the associated incoming line.

3,752,937
MAGNETIC-RECORDING AND REPRODUCING APPARATUS WHICH IS AUTOMATICALLY PLACED IN FORWARD MODE AFTER RESPONSE TO A PREVIOUS CONTROL SIGNAL

Keijiro Mori, Sakai-shi; Akito Sugahara, Yokohama; Kozo Yamamoto, Osaka, and Yukio Takeda, Neyagawa-shi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 14, 1971, Ser. No. 143,471
Claims priority, application Japan, May 18, 1970, 45/43021
Int. Cl. G11b 27/22, 27/28, 15/44
U.S. Cl. 179—100.2 S 3 Claims

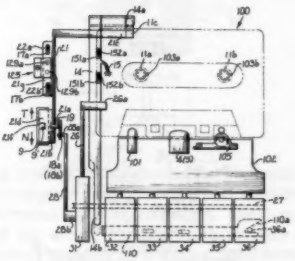


A magnetic-recording and reproducing apparatus wherein a magnetic tape recorded with a control signal at every section of information signals, has the information signal and the control signal reproduced therefrom, such that the reproduction operation is stopped in association with the control signal, and wherein when the tape is driven in the rewind direction from the stopped state, the rewinding operation is stopped in response to the control signal reproduced in the rewinding process.

3,752,938
MAGNETIC RECORDING AND REPRODUCING APPARATUS HAVING ELECTRICAL SWITCHING INTERLOCKED WITH MECHANICAL CONTROLS TO SENSE THE PRESENCE OF ABSENCE OF A CARTRIDGE TAB

Yasuo Ozawa, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed July 29, 1971, Ser. No. 167,171
Claims priority, application Japan, Aug. 1, 1970, 45/76738 (utility model)
Int. Cl. G11b 15/04, 23/04
U.S. Cl. 179—100.2 Z 11 Claims

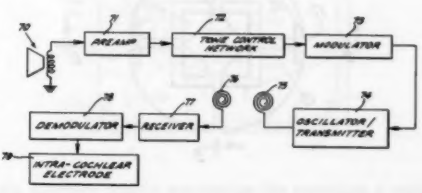


A cassette recorder/reproducer having a feeler to determine the presence or absence of a tab indicating permanent recording and means to deactivate the feeler when using a teaching cassette having one track of prerecorded teaching material and a second track on which the student may record and later play back his own material. The switching means also allows the magnetic head that operates on the teacher's track to be used either as a playback or recording head for cassettes other than instructional ones. The switching means are controlled by apparatus actuated when a cassette is removed at which time the circuits are automatically switched for non-instructional use and must be deliberately set for instructional use if that is desired.

3,752,939
PROSTHETIC DEVICE FOR THE DEAF

Melvin C. Bartz, Newport Beach, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Continuation-in-part of Ser. No. 075,142, Sept. 24, 1970, abandoned. This application Feb. 4, 1972, Ser. No. 223,415
Int. Cl. H04n 25/00
U.S. Cl. 179—107 R 24 Claims



There is disclosed a method and apparatus for inducing the sensation of intelligible hearing by direct electrical excitation of the auditory nerve endings distributed along the basilar membrane within the cochlea. An electrode is positioned within the lower scala of the cochlea by insertion through the

round window. The electrode consists of a resilient base member shaped to conform to the inner surface of the lower scala, such base member extending along the basilar membrane. The base member retains a pair of conductors which extend parallel to the length of the basilar membrane. Means are also provided for transmitting an excitation signal to a receiver implanted with and connected to the conductors. Several configurations for the electrode are disclosed as well as several techniques for the excitation thereof.

3,752,940

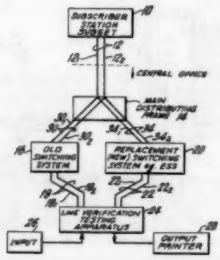
LINE VERIFICATION TESTER

Vincent F. Santulli, Manhasset, N.Y.; George Manos, Bridgeport, Conn.; John J. Gazzo, Jr., Commack, N.Y., and William P. Roumanos, Shelton, Conn., assignors to Porta Systems Corp., Roslyn, N.Y.

Filed July 10, 1972, Ser. No. 270,058

Int. Cl. H04m *3/26*

U.S. Cl. 179—175.2 R **18 Claims**



Card programable line verification tester apparatus iteratively and automatically establishes connections via old and replacement (e.g., ESS) switching apparatus to subscriber loop appearances on a main distributing frame. The assumed continuous tip and ring conduction paths are then tested for faults such as spurious battery, or short, open, high impedance or crossed connections.

3,752,941

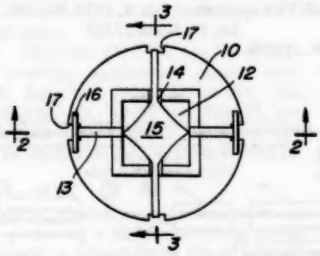
ELECTROACOUSTIC TRANSDUCERS

Frank Massa, Cohasset, and Gilbert C. Barrow, Scituate, both of Mass., assignors to Massa Division, Dynamics Corporation of America, Hingham, Mass.

Continuation of Ser. No. 17,430, March 9, 1970, abandoned. This application Dec. 20, 1971, Ser. No. 210,280

Int. Cl. H04r *17/00*

U.S. Cl. 179—110 A **9 Claims**



An electroacoustic transducer uses a bilaminar vibratile element having at least two plate members which are bonded together in face-to-face relationship, at least one of the plates being made from a piezoelectric material. Flexible electrical conductors freely support the bilaminar vibratile plate members on a frame. Any flexural vibrations of the bilaminar element apply an alternating voltage to the electrical conductors. A sonic energy mask is positioned over and spaced away from an exposed surface of the vibratile element to prevent sound radiation from the masked surface portion of the vibratile element.

3,752,942

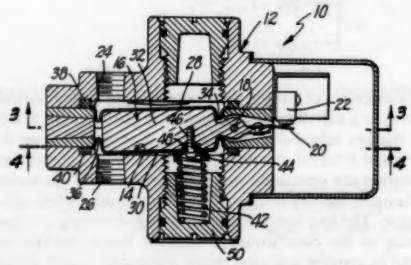
DIFFERENTIAL PRESSURE SWITCH WITH PIVOTED ONE-PIECE RIGID FLAT SWITCH-ACTUATING DISC MEMBER CAPTURED BETWEEN TWO ROLLING DIAPHRAGMS

Darrell F. McAfee, Artesia, Calif., assignor to DeLaval Turbine, Inc., Princeton, N.J.

Filed Mar. 10, 1972, Ser. No. 233,584

Int. Cl. H01h *35/34*

U.S. Cl. 200—83 Y **4 Claims**



A differential pressure switch comprising a one-piece rigid flat pivoted switch-actuating disc member isolated from the high and low actuating pressures by rolling diaphragms respectively carried by the housing of the pressure switch on opposite sides of and engaging opposite sides of the pivoted member. A compression coil spring biases the pivoted member against the action of the higher actuating pressure and a threaded seat for this spring serves to adjust the spring force applied to the pivoted member.

3,752,943

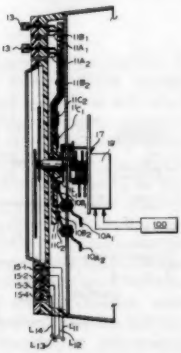
MULTIPLE MEMO TIMING DEVICE WITH ADJUSTABLE PIN CONDUCTORS

Raywend Wang, 10 Lane 2 Ching Tien St., Taipei, China /Taiwan

Filed July 15, 1971, Ser. No. 162,980

Int. Cl. H01h *43/18*

U.S. Cl. 200—33 R **1 Claim**



Timing device comprising clock means having a contactor arm and a conducting ring with conductor pins selectively set therein at locations corresponding to selected times, and a

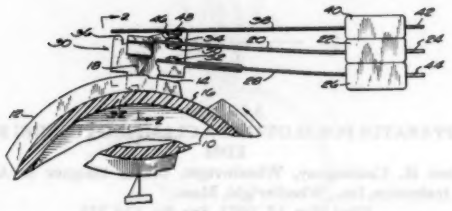
switching means including rotary cam means and switches and under the control of the clock means for simultaneously or separately controlling the connection of power source to one or more loads.

3,752,944

TIMER BLADE ARRANGEMENT

Roger J. Cartier, Hoffman Estates; George Obermann, Niles, and John Willigman, Elk Grove Village, all of Ill., assignors to Controls Company of America, Melrose Park, Ill.

Filed Nov. 1, 1971, Ser. No. 194,184
Int. Cl. H01h 3/42
U.S. Cl. 200—38 B 17 Claims



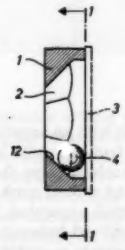
The timer has switches including upper and lower passive blades and an active blade therebetween. The distal end of the lower passive blade has depending spacers which straddle the cam upon which the follower on the distal end of the active blade rides. The spacers reference the lower passive blade off the hub of the drum type program cam. The lower passive blade is provided with a rest or stop for the upper passive blade limiting downward movement of that blade. With precision molding, both passive blades are accurately referenced from the cam hub and the location of the follower which actuates the active blade is precisely located. Accuracy of switching is increased without increased precision in manufacture. Use of two cam tracks permits simultaneous actuation of the active and "passive" blades to effect faster switching. It is possible to provide a "make-make" arrangement instead of the double throw arrangement.

3,752,945

ELECTRICAL ALTERNATING CONTACT SWITCH

Dieter Christian Achterberg, Krs. Landsberg/Lech, Haus Nr. 94, 8911 Schoeffelding, Germany

Filed June 14, 1972, Ser. No. 262,622
Claims priority, application Germany, June 4, 1971, P 21 27 900.5
Int. Cl. H01h 35/02
U.S. Cl. 200—166 BB 3 Claims



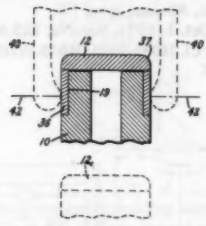
An electrical alternating contact switch is designed to produce switching impulses by inclining and rotating the switch and for this purpose is made up of an electrically conductive ring with a pyramidally tapered inner surface, a cover plate on the ring closing the larger end of this taper and having conductive and non-conductive parts, and a rolling body which can be released by tilting the switch so as to roll between the surfaces presented by the ring and the cover plate.

3,752,946

ARCING CONTRACT FOR AN ELECTRIC CIRCUIT BREAKER AND METHOD OF MAKING SAME

Cecil Bailey, Woodlyn, and Oscar C. Frederick, Springfield, both of Pa., assignors to General Electric Company, Philadelphia, Pa.

Filed Mar. 1, 1972, Ser. No. 230,856
Int. Cl. H01h 1/00
U.S. Cl. 200—166 C 7 Claims



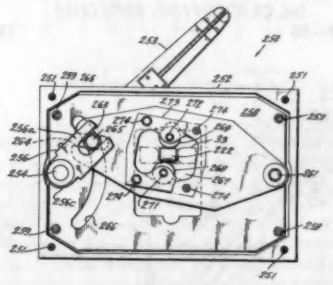
An arcing contact for an electric circuit breaker comprises a conductive support and an arcing part containing pressed-together, sintered-together refractory metal particles. The support and the arcing part have substantially flat surfaces which are joined together by a welded bond between said flat surfaces. A coating of plasma-arc sprayed material containing partially-fused interlocking, flattened particles of refractory metal covers said support in the region adjacent said arcing part to protect said support from hot arcing products. The arcing part is so located that it bears the principal arc-erosion duty imposed on the contact by arcs established by circuit-breaker opening.

3,752,947

AUXILIARY MECHANISM FOR OPERATING HANDLE OF CIRCUIT BREAKER

Albert Strobel, Cherry Hill, N.J., assignor to I-T-E Imperial Corporation, Philadelphia, Pa.

Filed July 27, 1972, Ser. No. 275,454
Int. Cl. H01h 3/02
U.S. Cl. 200—172 A 12 Claims



An auxiliary handle mechanism for operating a multipole circuit breaker is provided with a pair of links that transmits operating forces from a relatively long main operating handle to a relatively short circuit breaker handle extension. The main handle and links move in planes generally parallel to the front of the circuit breaker, and the circuit breaker handle moves in a plane generally perpendicular to the front of the

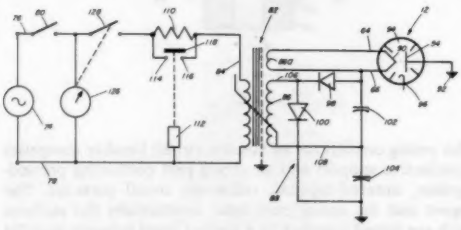
circuit breaker. The links are interconnected by a pin-roller means including a follower portion disposed in a cam slot. The latter is designed so that the relative effective lengths of the links change by virtue of the changing position of the connecting pin means relative to the fixed pivots of both links as for different positions of the main handle. The configuration of the cam slot is such that the mechanical advantage achieved by the auxiliary mechanism increases and decreases as the force requirements for operating the contact operating mechanism increase and decrease. As the mechanical advantage is reduced, the motion disadvantage is also reduced.

3,752,948

MAGNETRON STARTING CIRCUIT

Donald E. Peterson, Iowa City, Iowa, assignor to Amana Refrigeration, Inc., Amana, Iowa

Filed Oct. 1, 1971, Ser. No. 185,624
Int. Cl. H05b 9/06; H03b 9/10
U.S. Cl. 219—10.55 **1 Claim**



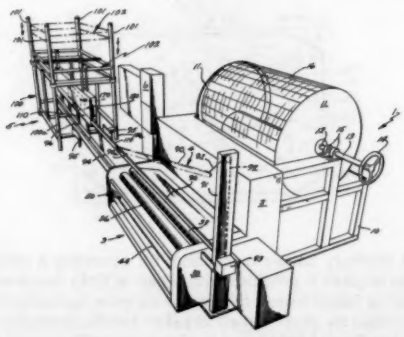
A circuit for and method of operating microwave oven apparatus is disclosed including means for the momentary interruption of the starting cycle at a predetermined time interval. Such operation will shift the operating mode of the energy generator as well as the voltage level from a higher to a lower frequency to prolong life and enhance efficiency. The invention is particularly suited for permanent magnet type energy generators for use in microwave oven apparatus where continuous operation is utilized. The invention may be implemented in all types of microwave oven apparatus simply and economically.

3,752,949

APPARATUS FOR CAGE ROLLING AND WELDING

Alfred A. Nordgren, Holland, Mich., assignor to New York Wire Mills Corporation, Tonawanda, N.Y.

Division of Ser. No. 55,071, July 15, 1970, Pat. No. 3,678,971.
This application May 18, 1972, Ser. No. 254,761
Int. Cl. B23k 11/08; B65b 13/10
U.S. Cl. 219—56 **10 Claims**



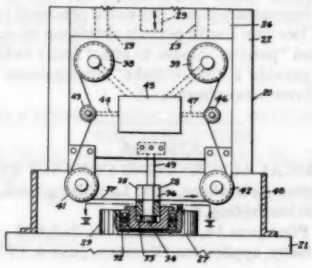
A storage crib is provided for a roll of wire fabric which is fed beneath a shear, to a cage forming assembly which forms the fabric into a concrete pipe reinforcing cage in such a manner that it encircles a boom extending over the forming rollers. When a cage is formed, the boom can be elevated, thus extracting the formed cage from the forming apparatus. The cage is then conveyed down the boom to a welding conveyor by which it is conveyed on a beam past a welding apparatus. The welding apparatus engages and holds a pair of juxtaposed circumferential wires and then travels with the cage as the wires are welded together. Upon completion of the weld, the wires are disengaged and the welding apparatus travels in the opposite direction towards the next pair of juxtaposed circumferential wires. The beam is supported by a plurality of supports which can be disengaged from the beam such that the cage can travel past each support as it travels towards the egress end of the welding apparatus.

3,752,950

APPARATUS FOR SLOTTING A CLAMPING BUSHING BY EDM

Leon H. Castonguay, Wheelwright, Mass., assignor to Astratronics, Inc., Wheelwright, Mass.

Filed Mar. 15, 1971, Ser. No. 124,331
Int. Cl. B23p 1/12
U.S. Cl. 219—69 V **4 Claims**



This invention has to do with an apparatus for slotting and a clamping bushing manufactured with such apparatus and, more particularly, to a machine using the E.D.M. process for slotting workpieces and the slotted work clamping bushing or collet manufactured on said apparatus. The apparatus has a wire electrode which is moved between two rolls, and has a workholder which is relatively movable linearly toward and away from the electrode and rotatable about an axis passing through the electrode. Cam means is provided to synchronize the two modes of motion. The bushing is formed of a right circular cylindrical tube, the sides of which are slotted. The slots are at some points parallel and at some points skewed to the generatrices.

3,752,951

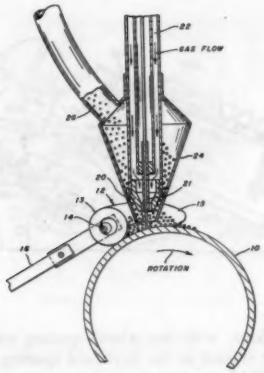
APPARATUS FOR WELDING WITH GRANULAR FLUX ON A ROTATABLE CYLINDRICAL SURFACE

Glenn E. Kniepkamp, 530 W. Smithfield St., Elizabeth Twp., Allegheny County, Pa.

Division of Ser. No. 127,903, March 25, 1971, Pat. No. 3,692,971. This application May 25, 1972, Ser. No. 256,995

Int. Cl. B23k 9/18

U.S. Cl. 219—73 1 Claim



Apparatus for confining granular flux in the proximity of a welding torch when making an overlay on a cylindrical surface.

3,752,952

PROCESS FOR PRECISION SETTING OF THE ELECTRON BEAM IN ELECTRON BEAM WELDING

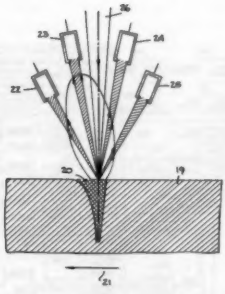
Jurgen Ruge, and Heiner Eggers, both of Braunschweig, Germany, assignors to Steigerwald Strahltechnik GmbH, Munchen, Germany

Filed Mar. 23, 1971, Ser. No. 127,331

Claims priority, application Germany, Mar. 24, 1970, P 20 13 950.8

Int. Cl. B23k 15/00

U.S. Cl. 219—121 EM 4 Claims



A process for the precise setting of the electron beam in electron beam welding by the capturing of the electrons scattered back from the moving workpiece or workpieces and/or through sensing of the secondary electrons in which the setting is performed by determining the directional distribution of the leaked back electrons and/or secondary electrons as a function of the geometry of the weld cavity produced. Since the angular distribution of the electrons leaked back by the weld cavity and/or the secondary electrons emitted therefrom is asymmetric in the half-space above the welding point, this distribution permits the geometry of the weld cavity to be deduced respectively the corresponding setting of the electron beam to be determined precisely.

3,752,953

METHOD FOR THE AUTOMATIC ELECTRIC WELDING OF ANGLE METAL PLATES THROUGH THREE ARCS IN SERIES, IN A SINGLE PASSING OPERATION

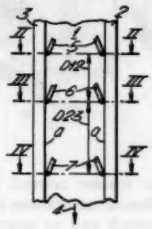
Giovanni Giardina, Venezia-Mestre, and Giovanni Lombardo, Genova-Sestri, both of Italy, assignors to Italsider S.p.A., Genova, Italy

Filed Oct. 14, 1971, Ser. No. 189,216

Claims priority, application Italy, Oct. 31, 1970, 13003 A/70

Int. Cl. B23k 9/00

U.S. Cl. 219—137 8 Claims



A method of automatically welding uncalked angle metal plates along a seam in which three spaced apart electrodes are moved along the seam and in which the first electrode is supplied with direct current and the trailing electrodes are supplied with alternating current.

3,752,954

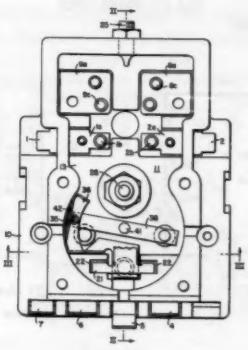
OVEN CONTROL

Calvin J. Holtkamp, Mansfield, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 20, 1971, Ser. No. 209,855

Int. Cl. A21b 1/00; H05b 1/00

U.S. Cl. 219—413 7 Claims

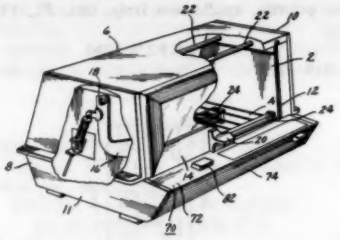


An oven control of the type having a bistable mechanism operable in accordance with oven temperature variations to effect opening and closing of snap-acting switch means series connected to directly control energization of the oven heating means is provided with a second creep action switch means which is operated between open and closed positions in accordance with the movement of the bistable mechanism, with the second switch means being connected in circuit means to provide control of any of various functions other than the main oven heating. The second switch means may control a door locking arrangement when the oven is of the self-cleaning pyrolytic type, or may be used to provide control of a safety signal for the oven, or to control auxiliary heating means in the oven whenever the temperature in the oven is below a predetermined level.

3,752,955
ELECTRIC OVEN TOASTER CONTROL MECHANISM

Lawrence L. Grove, Allentown, Pa., assignor to General Electric Company, Bridgeport, Conn.

Filed Jan. 19, 1973, Ser. No. 325,103
Int. Cl. F27d 11/02; A21b 3/02
U.S. Cl. 219—413 11 Claims

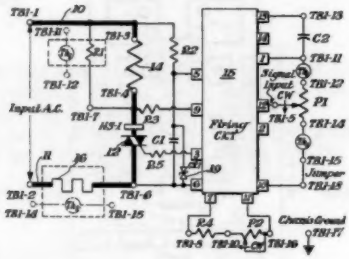


An electric oven toaster control mechanism wherein a unique lever and solenoid mechanism is arranged for cooperation with a main switch and an oven toaster door for permitting the switch to be closed when the door is closed and for allowing the solenoid to open the main switch at the end of a toasting cycle. A solenoid core is connected to an arm of a movable latch member for pivoting the latch member at the end of a toasting cycle to open a main switch. A spring urged door lever operates on the solenoid core and the arm of the latch member for preventing closure of the main switch when the oven toaster door is open.

3,752,956
ELECTRICAL RESISTANCE HEATING CONTROL CIRCUIT

Harold James Cahill, Wilmington, and Cornelius James Erickson, Newark, both of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 3, 1972, Ser. No. 249,821
Int. Cl. H05b 1/02
U.S. Cl. 219—505 7 Claims



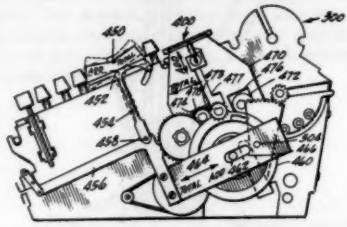
Apparatus for maintaining an electrical resistance load at substantially constant operating resistance level utilizing the sensed current and voltage inputs as joint control parameters.

3,752,957
BUSINESS MACHINES

Kenneth F. Oldenburg, Arcadia, Calif., assignor to Litton Business Systems, Inc., New Yok, N.Y.

Division of Ser. No. 50,064, June 26, 1970. This application Jan. 6, 1972, Ser. No. 215,869
Int. Cl. G07g 1/00
U.S. Cl. 235—7 R 18 Claims

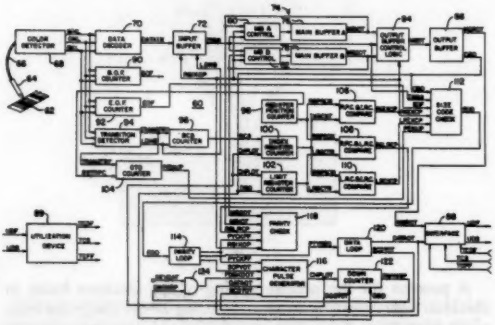
A cash register is provided with a flexible plastic digit tape to interconnect the cash register display with the selected depressed digit keys. The plastic digit tapes are very flexible and lightweight, and are operated to transmit force under tension to avoid binding and frictional forces. The digit tape is deflected down at the rear of the register to save space. The accumulator is moved down to engage the tape and to the rear to transfer to the display. Both the accumulator and the display assemblies have interleaved indicator wheels having different indications, with the wheel spacing and movement being unitarily related to the keyboard spacing. A combined ADD and TOTAL control, operating upon a cam-cam follower assembly is used to initiate the two modes of operation of the cash register to perform ADD cycles and TOTAL cycles of operation. Light duty components and simple controls, compatible with the low inertia of the digit tapes are used throughout the cash register.



3,752,958
FIELD DETECTION LOGIC

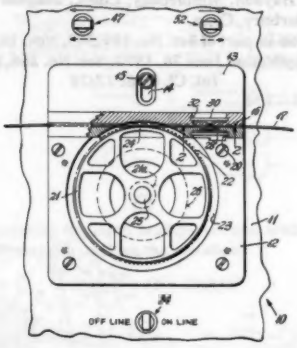
Robert C. Gilberg, Dayton; James P. Donohue, Fairborn, and Ramesh S. Patel, Kettering, all of Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed Dec. 7, 1971, Ser. No. 205,542
Int. Cl. G06k 7/12
U.S. Cl. 235—61.11 E 11 Claims



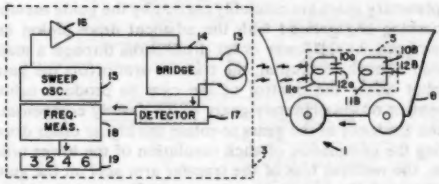
A system for processing a color bar code read optically from a coded medium is disclosed. The system includes logic for determining the binary code from color signals and storage means for temporarily storing the binary code. Logic is also provided which allows the reading of a double field tag and which checks the parity and the size of the captured message. Further, logic is provided for transmitting the captured message to a utilization device.

3,752,959
PERFORATED TAPE READER
Joe C. May, Cheshire, Conn., assignor to The Superior Electric Company, Bristol, Conn.
Filed Dec. 20, 1971, Ser. No. 209,983
Int. Cl. G05b 19/40; G06k 7/10
U.S. Cl. 235—61.11 E 8 Claims



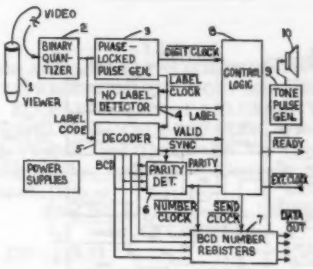
A reader for providing electrical signals using photocells that represents information coded by rows of perforations in tape in which the tape is moved by a stepping motor that accelerates its steps upon starting while decelerating in only two steps to a stop with each stop placing the row of perforations next to be read at the photocells.

3,752,960
ELECTRONIC IDENTIFICATION & RECOGNITION SYSTEM
Charles A. Walton, 19115 Overlook Rd., Los Gatos, Calif.
Filed Dec. 27, 1971, Ser. No. 212,281
Int. Cl. G06k 7/08
U.S. Cl. 235—61.11 H 6 Claims



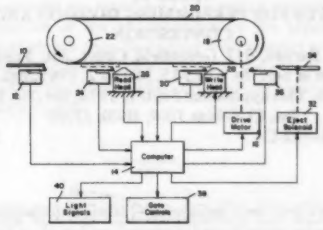
An electronic identification and recognition system for identifying or recognizing an object carrying an electrically passive circuit. The system comprises an active electrical signal generation network with a sensing coil for generating an electromagnetic field within the proximate area of said sensing coil; and an object having a passive electrical circuit with a coded resonant frequency, said object being adapted to move relative to and from said proximate area and adapted for inductive coupling with said active system. The active generation network being further adapted to generate digital control signals responsive to the resonant frequency of the passive object when said passive object is inductively coupled with said active system.

3,752,961
CIRCULAR TRACK CODED PATTERN READER
Bradford M. Torrey, Rutland St., Carlisle, Mass.
Filed Feb. 5, 1971, Ser. No. 112,959
Int. Cl. G06k 7/14, 19/06, 9/06; G01n 21/30; G01r 25/04
U.S. Cl. 235—61.11 E 10 Claims



A label reading system for reading a circular coded label with a scan path within a predetermined tolerance range of eccentricity between the circular label and circular scan path including means for scanning the label and producing label scan signals representing the encoded information; a clock pulse generator for generating clock pulses; a clock control circuit for controlling the frequency of the clock pulse generator and a variable synchronizing circuit responsive to the label code signals and to the clock pulses for producing a phase signal representative of the difference in phase between the clock pulses and the label code signals; the clock control circuit being responsive to the phase signal to vary the frequency of the clock pulse generator to synchronize clock pulses with the label code signals as the label code signals vary within the tolerance range.

3,752,962
MAGNETIC CARD HANDLING SYSTEM
Paul Greskovics, Manhatten Beach, Calif., assignor to Western Data Products, Inc., Los Angeles, Calif.
Filed Mar. 14, 1972, Ser. No. 234,516
Int. Cl. G06k 13/07
U.S. Cl. 235—61.11 D 8 Claims

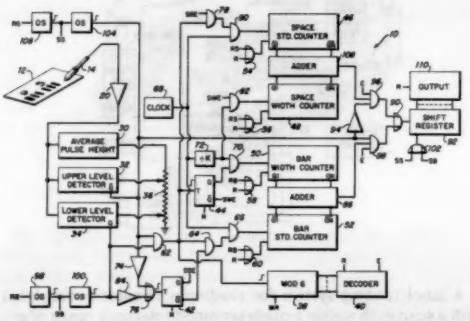


This invention describes a high speed card handling system for writing and reading magnetically encoded information into and from a card. Registration of the card with respect to the heads and moving the card at a constant velocity is achieved by using an endlessly rotating belt that is skewed at an angle with respect to a fixed linear card guide. The endless rotating belt frictionally engages the card and moves the card from the read head to the write head. The endless belt being skewed with respect to the fixed guide continuously urges the moving card against the guide thereby maintaining registration of the card at all times.

3,752,963
METHOD OF AND APPARATUS FOR INTERPRETING A CODED RECORD

Carlos B. Herrin, Bellbrook, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Apr. 12, 1972, Ser. No. 243,235
Int. Cl. G06k *7/10*; E04g *17/00*
U.S. Cl. 235—61.11 E 11 Claims

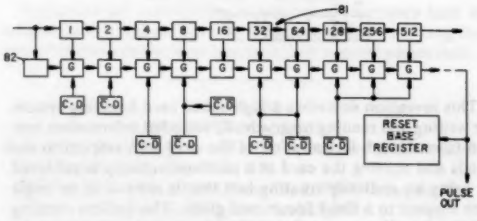


A machine readable, binary coded record or label includes alternating bars and spaces of different reflectivity in which the widths of the bars and spaces are assigned one of two values representing a binary "1" or a binary "0". This record is scanned by an optical reader having a scanning aperture of known dimensions. When the record is scanned, the widths of the bars and spaces forming a complete code are individually and sequentially determined and stored in bar and space registers. During the scanning, the passage of the reader aperture over the leading or trailing edge of each bar and space results in a reader output signal having a slope related or proportional to the dimension of the aperture. This slope is determined by signal level detectors and is used to store a reference or standard value. This standard or reference value is compared with the stored widths of the individual bars and spaces to determine the 1 and 0 significance of the bars and spaces. In this manner, the establishment of a reference width value based on the scanning aperture size and its effect on the reader output signal renders record interpretation substantially independent of reading speed or apparent bar and space width.

3,752,964
APPARATUS FOR PERFORMING DIVISION AND BASE CONVERSION

William S. Barnes, 912 Greenfield Court, Mt. Prospect, Ill.

Division of Ser. No. 625,913, March 7, 1967, Pat. No. 3,559,170. This application Sept. 1, 1970, Ser. No. 68,772
Int. Cl. G06m *3/00*; H03k *13/00*
U.S. Cl. 235—92 CA 9 Claims

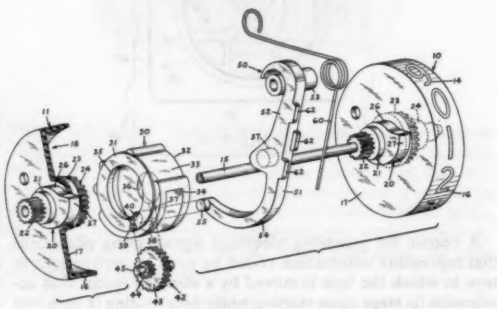


A method of representing numerical information in binary form wherein a plurality of dot patterns are established on a data medium and numerical weighting is given to each dot pattern by selectively joining dot pairs of the pattern with essentially straight lines, and apparatus for reading numerical information in the form set out above including apparatus which utilizes electronic pulses or sensing scanners for interrogating the space between dot pairs which can have lines drawn therebetween in order to determine the numerical weighting of a numerical dot pattern.

3,752,965
COUNTING DEVICE

Arthur W. Haydon, Middlebury, Conn., assignor to Tri-Tech, Inc., Waterbury, Conn.

Continuation-in-part of Ser. No. 197,343, Nov. 10, 1971. This application June 26, 1972, Ser. No. 266,131
Int. Cl. G06c *15/26*
U.S. Cl. 235—136 19 Claims



A transfer counter in which the planetary gears for transferring motion from one register drum to another are maintained at a fixed distance from the axis of the drums by a generally cylindrical guide member between the drums. Each drum includes a compensating cam and a drive pinion on the side of the drum facing the next higher order drum, and a driven gear on the side facing the next lower order drum. A resiliently biased transfer arm is pivotally supported about an axis parallel to but spaced from the axis of rotation of the drums. The transfer arm is slidably connected to the guide member, while the planetary gears are rotatably carried by the guide member in meshing engagement with the adjacent drive pinion and driven gear. As the lower order drum turns through a major portion of each revolution, the transfer arm pivots the guide member under the control of the cam to produce orbital movement of the planetary gears which exactly compensates for the tendency of the gears to rotate the higher order drum. During the completion of each revolution of the lower order drum, the resilient bias of the transfer arm acts on the guide member and the planetary gears to rapidly move the higher order drum to its next position.

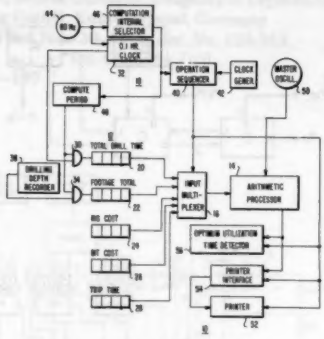
3,752,966
DRILL BIT UTILIZATION OPTIMIZER

Fred P. Foy, Jr., Fullerton, and Nuke Ming Chang, San Francisco, both of Calif., assignors to Santa Fe International Corporation, Los Angeles, Calif.

Filed May 28, 1971, Ser. No. 147,887
Int. Cl. G06f *15/46*; E21b *45/00*
U.S. Cl. 235—150.1 33 Claims

Disclosed is a special purpose digital data processor to generate information for optimizing the utilization time of a drilling bit for oil wells, etc. The system includes a series of registers for storing constant and variable numbers, an

arithmetic unit, an input multiplexer for providing data from the input registers to the arithmetic unit and program control



logic for operating the input multiplexer and arithmetic unit at preselected intervals to solve the equation:

$$C=[B+(T+D)R]/F$$

where:

C = footage cost in $ per foot;
B = bit cost in $;
D = drilling time in hours;
T = bit change round trip time in hours;
R = rig cost in $ per hours; and
F = footage drilled in feet.

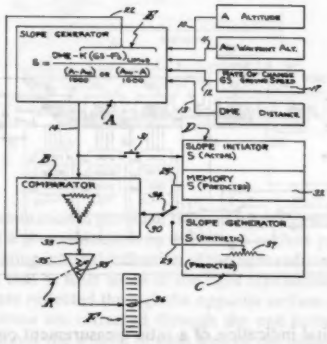
Information output is provided by a printer and an light emitting diode numeral display. Also, means may be provided to indicate when the result of a computation of footage cost exceeds the numerical of the immediately previous computation.

3,752,967

ASCENT AND DESCENT SLOPE TRACKER SYSTEM

Carl W. Victor, 2116 Linda Flora Dr., Los Angeles, Calif.

Filed Dec. 20, 1971, Ser. No. 209,850
Int. Cl. G06g 7/78; G06f 15/50
U.S. Cl. 235—150.22 **40 Claims**



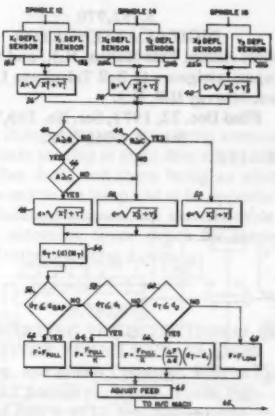
Aircraft instrumentation that presents a readout or control by which said aircraft can be piloted along a predetermined slope or any selected slope to a waypoint, utilizing normally available area navigation inputs and characterized by its adaptability to dynamic conditions; comprised generally, of a present position and speed to a waypoint slope ratio generator means, a synthetic slope generator means and/or a slope initiator and memory means, a comparator means balancing the outputs of the first mentioned generator means and either the synthetic slope generator means or the slope initiator and memory means and powering a readout or equivalent aircraft control; and to the end that readily available navigational inputs are advantageously employed in the determination of and adherence to selected ascent and/or descent slopes to a waypoint.

3,752,968

METHOD AND APPARATUS FOR PRODUCING SIGNALS REPRESENTING THE MOST SIGNIFICANT ECCENTRICITIES OF A PLURALITY OF SIMULTANEOUSLY ROTATING SPINDLES

Emile J. Pilafidis, and Thiagarajan Viswanathan, both of Cincinnati, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed July 6, 1971, Ser. No. 159,826
Int. Cl. G06f 15/46
U.S. Cl. 235—151.11 **3 Claims**



An apparatus and method for producing a signal representing the most significant eccentricities of a plurality of rotating spindles in a multiple spindle machine tool. The eccentricities of each spindle are monitored to produce a plurality of signals as a function of the eccentricities of the separate spindles. These signals are then compared with respect to one another. The most significant signal at any instant in time is then produced as an output signal representing the most significant eccentricity signal.

3,752,969

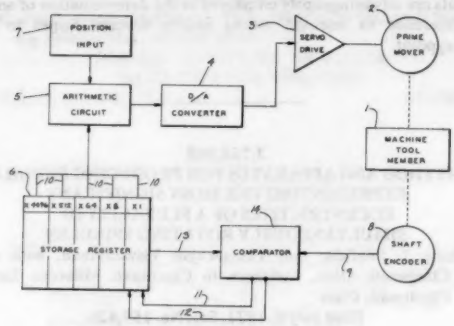
METHOD AND MEANS FOR UPDATING THE POSITION DIMENSION OF A NUMERICALLY CONTROLLED MACHINE TOOL

William W. Kiffmeyer, and Joseph D. Radtke, both of Milwaukee, Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Sept. 24, 1971, Ser. No. 183,496
Int. Cl. G06f 15/46
U.S. Cl. 235—151.11 **6 Claims**

A machine position dimension contained in a storage register is compared with a command position dimension contained in a position unit to obtain a digital error signal for controlling a machine tool. Increments of displacement are sensed

by an eight-position shaft encoder. The shaft encoder output is periodically compared with the least significant digit in the



storage register, and when necessary, counts are generated to the storage register to update the machine position dimension.

3,752,970

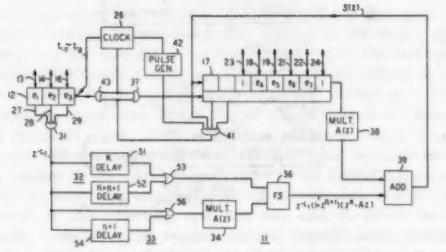
DIGITAL ATTENUATOR

Marvin Robert Aaron, Fair Haven, N.J., and Hisashi Kaneko, Tokyo, Japan, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 22, 1971, Ser. No. 210,795

Int. Cl. G06f 7/39

U.S. Cl. 235—152 **10 Claims**



Attenuation is performed directly on a compressed PCM code by means of a circuit which treats the characteristic bits and the mantissa bits in accordance with an attenuation algorithm. The characteristic bits are applied to a counter circuit whose output is used to produce a first term of the algorithm and the mantissa bits are applied to a shift register whose output is used to generate a second term of the algorithm. The two terms are added together and used to generate the characteristic bits of the attenuated signal.

3,752,971

EXPANDABLE SUM OF CROSS PRODUCT MULTIPLIER/ADDER MODULE

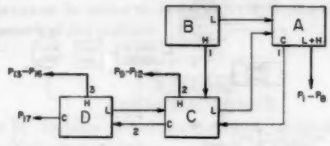
Donald F. Calhoun, Torrance, and Robert E. Ziff, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

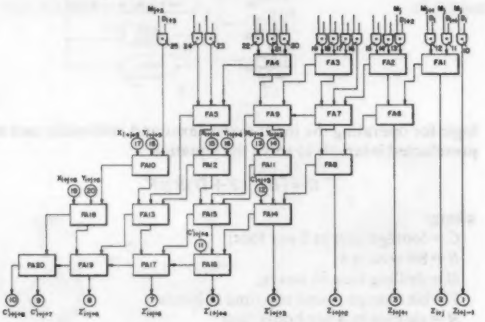
Filed Oct. 18, 1971, Ser. No. 190,023

Int. Cl. G06f 7/52

U.S. Cl. 235—164 **5 Claims**

A high speed digital multiplier which includes a plurality of functionally and structurally identical multiplier modules. Each multiplier module is adapted to perform an N × N bit multiplication. In addition, each module accepts product bits and carry bits from other multiplier modules and adds them to the N × N bit product according to the appropriate bit weights. Several modules are interconnected for M × M bit multiplications where M is greater than N. The modules con-





tain all the circuitry necessary for performing the multiplication.

3,752,972

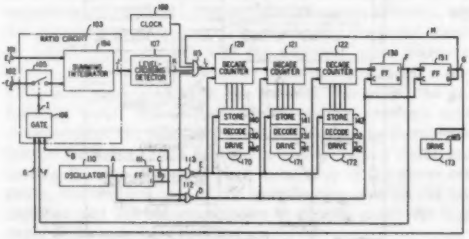
DIGITAL RATIO CIRCUIT INCLUDING ZERO SUPPRESSION

Loran William Campbell, Jr., Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Dec. 27, 1971, Ser. No. 212,204

Int. Cl. G06g 7/16; G06f 7/52

U.S. Cl. 235—196 **10 Claims**

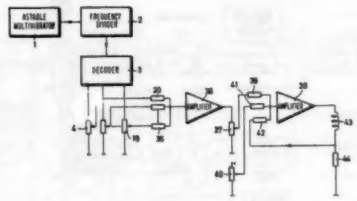


A digital indication of a ratio measurement on a zero suppressed scale is obtained directly by employing a summing integrator. An analog signal representative of the desired ratio indication is generated by selectively controlling the supply of test signals to the integrator. A comparator circuit is employed to generate a pulse signal having a width representative of the interval between prescribed threshold levels of the integrator output. Timing circuits, decade counters, flip-flop circuits and logic gates are utilized to convert the comparator output into digital form and to generate signals for selectively controlling the supply of test signals to the summing integrator.

3,752,973
APPARATUS FOR PRODUCING VOLTAGE FUNCTIONS

Gernot Thorn, Hanau am Main, and Johann Sturmer, Freigericht, both of Germany, assignors to Leybold-Heraeus-Verwaltung GmbH, Koln-Bayental, Germany

Filed June 30, 1971, Ser. No. 158,262
Int. Cl. G06g 7/16
U.S. Cl. 235—197 1 Claim

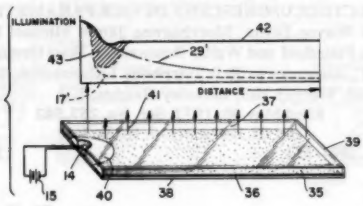


An astable multivibrator applies periodically generated pulses to a frequency divider. The pulses from the frequency divider are decoded by a binary-to-decimal converter, and the outputs of the converter are applied to a plurality of potentiometers. The voltages from the movable contacts of the potentiometers are transmitted to a mixing amplifier which feeds an output amplifier. The output amplifier provides a signal to a deflection coil.

3,752,974
UNIFORM ILLUMINATION WITH EDGE LIGHTING

Myron Lewis Baker, Seal Beach, and Lewis William Myers, Thousand Oaks, both of Calif., assignors to Coastal Dynamics Corporation, Westlake Village, Calif.

Filed Dec. 13, 1971, Ser. No. 207,218
Int. Cl. B60q 3/04
U.S. Cl. 240—1 EL 12 Claims



Uniform illumination is provided from an edge lighted optical medium of a given thickness by diffusing a surface portion normally providing internal reflection of the light radiated into the edge such that at least some of the light rays striking the diffused area are reflected through the opposite surface of the medium and some are refracted through the one surface. A cleared area about the source of light free of the diffusion is provided and treated by application of coatings on opposite surface portions of the medium defining the cleared area. These coatings have an index of refraction less than that of the medium such that light is channeled by internal reflection between the surfaces of the medium and inhibited from escaping from the medium in the vicinity of the cleared area. This cleared area has a radius of preferably three to four times the thickness of the optical medium. The resulting light emmination from the surface of the medium is substantially uniform beyond the cleared area.

3,752,975
FLAG POLE LIGHT

Max E. Meyer, 4623 Woodway Dr., Fort Wayne, Ind.

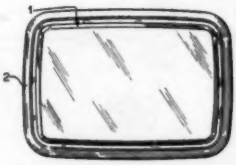
Filed June 7, 1971, Ser. No. 150,623
Int. Cl. F21v 33/00
U.S. Cl. 240—2 1 Claim

A flag pole for flying a flag, the pole being surmounted by a lamp so to illuminate the flag at night thus eliminating need to lower the flag after dark, and there being an electric cable connected at one end to the lamp and at its opposite end to an electric power source of a house, the electric cable being intercepted by an automatic timer switch for turning on the lamp at dusk and turning it off at dawn.

3,752,976
DEVICE FOR VARYING THE DIRECTIONAL SETTING OF MOTOR VEHICLE HEADLAMPS

Salvatore Di Salvo, and Mario Collazuol, both of Turin, Italy, assignors to FIAT Societa per Azioni, Turin, Italy

Filed July 9, 1971, Ser. No. 161,006
Claims priority, application Italy, July 21, 1970, 53474 B/70
Int. Cl. F21v 19/02
U.S. Cl. 240—41.6 3 Claims



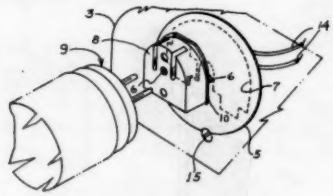
A device for adjusting the inclination of a vehicle headlamp in a vertical plane between two predetermined directional settings to allow for variations in the longitudinal trim of a vehicle under different load conditions, independently of the normal adjustment of the headlamp directional setting. The adjusting screw which controls the rocking movement of the headlamp unit in a vertical plane engages a U-section elastic member which is snap-engageable by suitable elastic deformation into seats provided in the headlamp support plate selectively in two operative positions corresponding to the two predetermined headlamp settings.

3,752,977

ADJUSTABLE FLUORESCENT LAMP MOUNTING MEANS

Rooney W. Davis, Mehlville, Mo., assignor to Sola Basic Industries, Inc., St. Louis, Mo.

Filed Apr. 20, 1972, Ser. No. 245,887
Int. Cl. H05b *33/02*
U.S. Cl. 240—51.12 **12 Claims**



In an adjustable fluorescent lamp holder for use in a lighting fixture, a plate member(s) pivotally mounts to an end panel of the fixture and said plate removably supports a lamp socket for accommodating this type of a lamp, and particularly a fluorescent lamp of the U-shaped variety. The plate is pivotal in its mounting to the panel, and a locking means is provided for fixing said plate to the same as when it has been adjusted for positioning of its attaching socket at an approximate location for mounting of a U-lamp of a particular size, in said plate, upon loosening of said locking means, capable of being pivoted for repositioning of said socket to dispose it for accommodating a U-lamp of differing size.

ERRATUM

For Class 240—2 W see:
Patent No. 3,753,217

3,752,978

PHOTOELECTRIC INTRUSION DETECTOR

William G. Kahl, Jr., Brookfield, and Andrew J. Davenport, New Milford, both of Conn., assignors to Arrowhead Enterprises, Inc., Bethel, Conn.

Filed Feb. 4, 1971, Ser. No. 112,632
Int. Cl. G01t *1/16*
U.S. Cl. 250—340 **1 Claim**

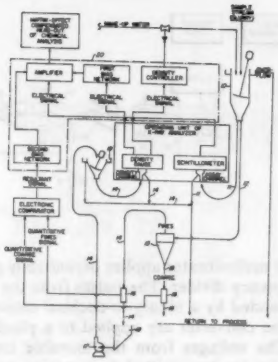
There is disclosed a photoelectric intrusion detector comprising a transmitter unit and a receiver unit. Each unit includes a collimating lens and a mirror adjustable about two axes of rotation. The detector employs an infrared beam invisible to the human eye and the mirror of each unit is positioned behind a dark red window, making it extremely difficult to ascertain beam direction. Jamming of the system is prevented by utilizing a pulsed, rather than a steady, beam. This also makes the system substantially insensitive to ambient light. There is also disclosed means for rapid alignment upon installation by method of an external visible light source attachable to each unit in turn, followed by adjustment of the mirror of the other unit.

3,752,979

METHOD AND APPARATUS FOR MATRIX-EFFECT-COMPENSATED CONTINUOUS X-RAY ANALYSIS OF STREAMS OF SOLID PARTICLES

Hans H. Pick, Salt Lake City, Utah, assignor to Kennecott Copper Corporation, New York, N.Y.

Filed Sept. 2, 1971, Ser. No. 177,413
Int. Cl. G01n *21/00*
U.S. Cl. 250—375 **9 Claims**



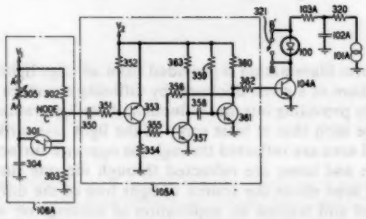
A method and apparatus for X-ray fluorescence spectrographic analysis of streams of solid particles, wherein a matrix-effect-compensated, chemical analysis readout is obtained by separating the stream into fine and coarse component streams, sensing the mass-flow of the component streams to provide respective signals representative of such mass-flows, comparing the signals and feeding a resultant signal to an X-ray fluorescence spectrographic analyzer as a corrective factor in its operation, and passing a corrected signal to the r eadout means of such analyzer.

3,752,980

APPARATUS FOR MEASURING ELECTROLUMINESCENT DEVICE PARAMETERS

Richard Wayne Dixon, Morristown; James Michael Ralston, North Plainfield and Walter Rosenzweig, West Orange, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed May 30, 1972, Ser. No. 257,582
Int. Cl. G01n *21/16*; H03k *3/42*
U.S. Cl. 250—552 **12 Claims**



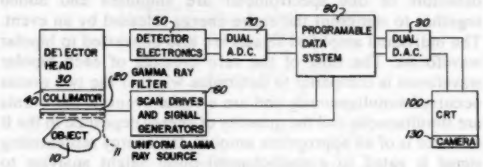
Apparatus and method for measuring output characteristics of an electroluminescent device as a function of the amplitude of an input current pulse. The pulse duty factor and pulse amplitude of the input current to the electroluminescent device are varied to maintain a constant time-averaged input current such that the magnitude of the time-averaged light output radiant flux is a function essentially only of the input current pulse amplitude.

3,752,981

SCINTILLATION CAMERA WITH IMPROVED RESOLUTION

Ronald J. Jaszczak, Arlington Heights, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed Mar. 10, 1972, Ser. No. 233,670
Int. Cl. G01t 1/20
U.S. Cl. 250—368 5 Claims



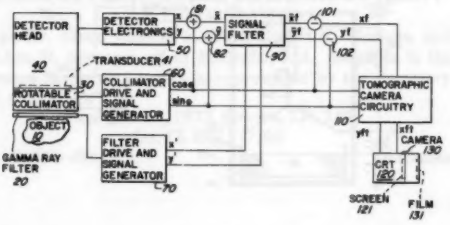
An Anger-type scintillation camera system fitted with a gamma ray filter between the object under study and the detector and an output signal filter of the signal funneling type which employs a non-linear array of signal filter windows to compensate for inherent non-linear spatial response characteristics in the camera system.

3,752,982

TOMOGRAPHIC SCINTILLATION CAMERA WITH IMPROVED RESOLUTION

Ronald J. Jaszczak, Arlington Heights, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed Feb. 23, 1972, Ser. No. 228,640
Int. Cl. G01t 1/20
U.S. Cl. 250—368 2 Claims



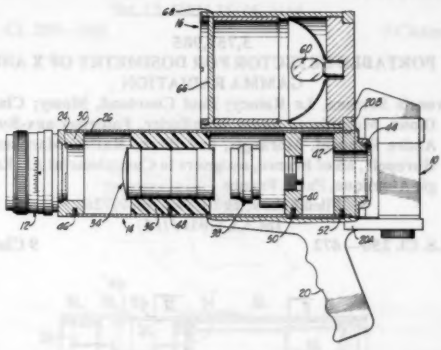
An Anger-type scintillation camera employing a rotating slanted channel collimator and associated circuitry to produce a tomographic imaging capability and also employing a scanning radiation filter and associated signal filtering circuitry to improve the resolution of the tomographic imaging. Circuitry at the output of the camera corrects the detector output signal before they are processed by the signal filtering circuitry to eliminate the effect of apparent circular precession of passageways in the radiation filter caused by rotation of the collimator. After signal filtering the effect of apparent circular precession of the radiation filter passageways is reintroduced either by separate circuitry before processing by tomographic camera circuitry or by tomographic camera circuitry adapted to allow for the earlier signal correction. The system may employ the rotating collimator alone or in conjunction with a bed which precesses in a circle.

3,752,983

INFRARED VIEWING AND PHOTOGRAPHY

Serge J. Yanez, Arcadia, Calif., assignor to Condamatic Company, Inc., Warren, Mich.

Filed Sept. 13, 1971, Ser. No. 180,044
Int. Cl. H01j 31/50
U.S. Cl. 250—333 6 Claims



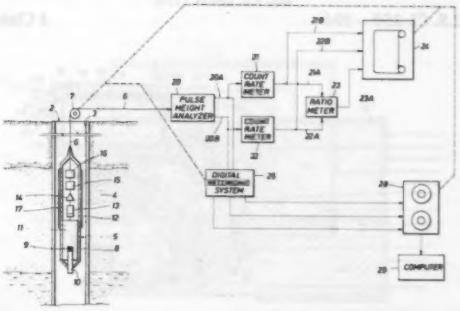
An infra red attachment for a single lens reflex 35mm camera body involves imaging optics within which are axially aligned a first lens system, an infra red image converter, and a second lens system, in that order. The first lens system serves to focus infra red on the converter. The second lens system serves to focus a visible image produced by the converter onto black and white type, slow speed film within the single lens reflex camera body which is releasably connected to such light tube whereby a person may see an infra red converted image just prior to its being photographed on black and white film in the camera body.

3,752,984

METHODS AND SYSTEM FOR DETECTING SUBSURFACE MINERALS

Hubert D. Scott, Houston, Tex., and Robert E. Maute, Columbus, Ohio, assignors to Texaco Inc., New York, N.Y.

Filed Dec. 2, 1971, Ser. No. 204,071
Int. Cl. G01t 1/18
U.S. Cl. 250—261 18 Claims



An improved radiological borehole logging system and technique for detecting sulfur is provided for use in cased or uncased boreholes. The earth around the borehole is irradiated with neutrons, and pulses are generated which are representative of the number and energies of the resulting secondary gamma radiations. The pulses are sorted into a first group comprising a high energy range of gamma rays including sulfur-emitted gammas, and a second group comprising a lower energy range of gammas including those emitted by

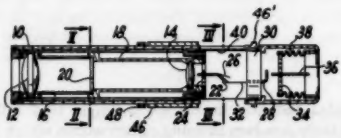
nuclei of calcium, silicon, chlorine and iron. The energy ranges are chosen so that the ratio of the count rates of these two groups will be substantially constant unless the irradiated formation happens to contain a significant number of sulfur nuclei. Accordingly, a change in the ratio may be taken as an indication of the presence of a sulfur-bearing formation, and the magnitude of the change will be functionally related to the relative proportion of sulfur in the formation.

3,752,985

PORTABLE DETECTOR FOR DOSIMETRY OF X AND GAMMA RADIATION

Francis Berman, Le Raincy; Paul Courtaud, Massy; Claude Dioux, Monthlery; Andre Manifacier, Fontenay-aux-Roses; Andre Raboeuf, Morangis, and Pierre Ruffet, Marolles en Hurepoix, all of France, assignors to Commissariat AL Energie Atomique, Paris, France

Filed Feb. 9, 1970, Ser. No. 9,726
Int. Cl. G01t 1/14
U.S. Cl. 250—472 **9 Claims**



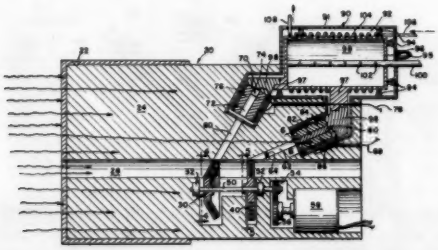
In a dosimeter comprising a microscope and a fiber electrometer contained in a thin-walled cylindrical ionization chamber, at least one sleeve can be caused to slide over the exterior of the chamber so as to cover or uncover its thin wall, thereby endowing the dosimeter with a selectable response equivalent to radiation doses absorbed under a protection of different thicknesses of human body tissue, instant measurements being taken as a function of the skin dose by means of a double-scale reticule.

3,752,986

COMPTON SCATTER ATTENUATION GAMMA RAY SPECTROMETER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and William E. Austin, Wayne, Pa.

Filed Mar. 3, 1972, Ser. No. 231,662
Int. Cl. G01t 1/16
U.S. Cl. 250—394 **3 Claims**



A gamma ray spectrometer system for obtaining gamma ray spectra from intense gamma field containing significant neutron flux. Spectra are maasured for a continuous gamma spectrum from about 50 Kev to 7 Mev or higher.

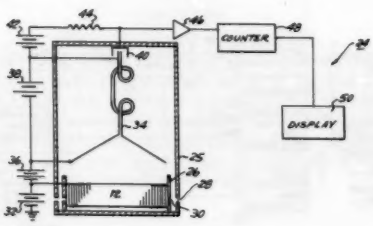
A radiation shield protects individual spectrometers from the incident radiation. An aperture in the shield admits a collimated radiation beam. Compton scattering targets are placed in the radiation beam to scatter part of the beam into the individual spectrometers. The targets are made changeable to control the rate at which radiation strikes the spectrometers. Two spectrometers are used, one for low energy radiation and one for high energy radiation, the axis of the low energy spectrometer is placed at a 60° angle to the radiation beam and the high energy spectrometer is placed at a 20° angle to the radiation beam. The spectrometers are rotationally symmetric and comprise an inner or "A" detector on which the radiation is incident and an outer or "B" detector which is subject to radiation scattered in detector A. The spectrometers employ sum-compton coincidence techniques to distinguish signal events from background events. The output from the A & B detectors of one spectrometer are amplified and added together to represent the entire energy released by an event. The individual amplified sigaals are also converted to bipolar waveforms. The time of the zero crossing of each bipolar waveforms is compared to determine whether the two events occurred simultaneously and are a signal event. If the events are simultaneous and the quantity of energy deposited in the B detector is of an appropriate amount, the energy representing signal is gated to a multichannel pulse height analyzer to determine the energy of the incident radiation which created the event. This information is recorded for readout and analysis. When the number of coincident events counted by a spectrometer exceeds 10^4 per second, the Compton Scattering targets are changed to less dense ones which scatter a smaller percentage of the radiation beam and thus reduce the count rate.

3,752,987

SYSTEM FOR DETECTING HIGH ENERGY ELECTROMAGNETIC RADIATION

Christopher H. Tosswil, Ann Arbor, Mich., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Mar. 29, 1971, Ser. No. 129,082
Int. Cl. G01t 1/16
U.S. Cl. 250—336 **15 Claims**



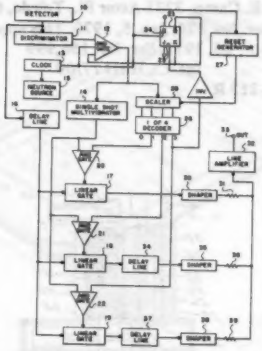
An array comprising a large number of thin walled electron multiplying passageways is disposed in a housing having windows disposed so that high energy or penetrating electromagnetic radiation passing through the windows strikes the side of the passageway array. The high energy radiation penetrates the passageway walls and undergoes interactions with the wall electrons and atoms in a statistically determinable manner. The array includes a sufficient number of passageways, and the passageway walls are sufficiently thin to provide a probability substantially of unity that high energy radiation striking the array will impart energy to electrons sufficiently close to the surface of a passageway wall to cause at least one electron to be emitted from a passageway wall. The array multiplies emitted electrons and provides an output pulse of a number of output electrons in response to each received high energy electromagnetic radiation signal. The array provides sufficiently large output pulses that will not be lost by apparatus for detecting and counting those pulses.

3,752,988

CIRCUIT FOR REDUCING PULSE PILE-UP IN PULSE DETECTION SYSTEMS

Richard B. Culver, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed June 1, 1971, Ser. No. 148,765
Int. Cl. H01j 39/30
U.S. Cl. 250—270 15 Claims



The amplified pulses from a radioactivity detector are coupled to a discriminator and via a 400 nanosecond delay line to the inputs of three linear gates. The discriminator is AND gated with a clock pulse and a J-K flip-flop. A scale of four and a 1 of 4 decoder and a single shot multivibrator are driven by the AND gate output. The single shot output and the decoder outputs are AND gated to control the linear gates.

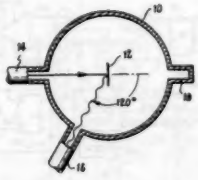
In an alternative embodiment, the linear gates and delay lines are replaced with charge and hold, delay and interrogate circuits.

3,752,989

METHOD OF PRODUCING AN INTENSE, HIGH-PURITY K X-RAY BEAM

Joseph W. Motz, Charles E. Dick, Robert C. Placious, and Julian H. Sparrow, all of Rockville, Md., assignors to the United States of America as represented by the Secretary of Commerce

Filed Jan. 27, 1972, Ser. No. 221,249
Int. Cl. H01j 37/00
U.S. Cl. 250—401 4 Claims



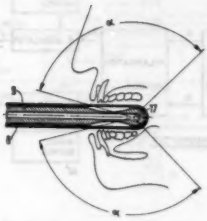
This method comprises the steps of bombarding an X-ray target of atomic number Z with a substantially monoenergetic electron beam having an energy in the region from about $(Z+0.0014Z^3)$ to about $(3Z+0.0092Z^3)$ kev. and collimating into an output beam the X-rays emitted from the target at an angle in the range from about 120° to about 180° with respect to the direction of the electron beam.

3,752,990

X-RAY DEVICE HAVING AN ANODE TUBE WITH FILTERING MEANS THEREON

Heimbert Fischer, Feldbergstrasse 1, D 7801 Vorstetten, Germany

Filed June 18, 1971, Ser. No. 154,530
Claims priority, application Germany, June 22, 1970, P 20 30 624.5
Int. Cl. H01j 35/16, 5/16
U.S. Cl. 250—503 7 Claims



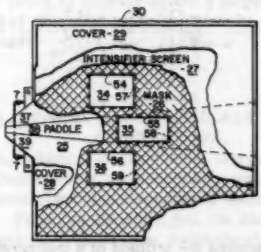
A device for use in the production of dental X-ray photographs comprises a hollow-anode X-ray tube projecting from a housing with the tube specially mounted to absorb shocks and stresses imposed on the anode tube. The anode tube which projects from the housing is preferably shielded when not in use by a projecting tube slidable relative to the housing. The device may also include a second X-ray tube for intra-oral and extra-oral photography with this second tube emitting X-rays at 90° to the axis of the hollow anode X-ray tube. Prefiltering material may be provided on the head of the anode tube or the head of the anode tube may be specially shaped so that uniform prefiltering of the radiation from the anode tube occurs over the beam angle necessary for full-mouth photography.

3,752,991

PHOTO TIMER

Edward Slagle, Lyndhurst, Ohio, assignor to Picker Corporation, Cleveland, Ohio

Filed June 28, 1971, Ser. No. 157,536
Int. Cl. H05g 1/38
U.S. Cl. 250—460 24 Claims

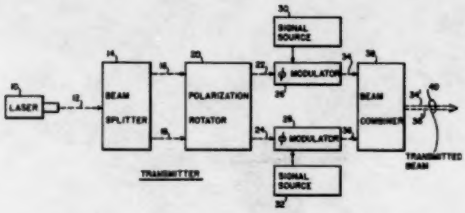


A phototimer for controlling a radiographic exposure includes a plurality of light transmitting panels each having a light accepting portion adjacent a separate area of fluorescent screen. The light transmitting panels have light emitting portions positioned adjacent a light responsive phototube. Movable shielding means selectively block the transmission of the light from the light transmitting panels to the phototube whereby light from selected portions of the fluorescent screen may be transmitted to the light responsive phototube.

3,752,992
OPTICAL COMMUNICATION SYSTEM

Frederick R. Fluhr, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 28, 1969, Ser. No. 828,550
Int. Cl. H04b 9/00
U.S. Cl. 250—199 **2 Claims**

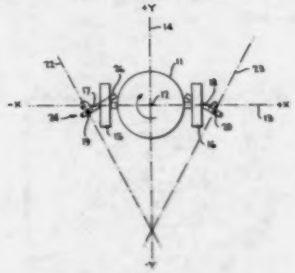


An optical communication system including a device for splitting the output beam from a laser into two quadrature polarized beams, phase modulators for modulating at least one of the two beams, and a combiner for thereafter aligning the two means in a non-interfering manner for transmission along a single path. The system further includes a receiver for receiving and separating the two transmitted beams, a rotator for axially re-aligning the polarized beams, and a combiner for combining the two beams in an interfering manner thereby causing amplitude modulation of the combined beam. The signal information is then removed from the amplitude modulated beam by a detector and fed to any suitable readout device.

3,752,993
SPACECRAFT ATTITUDE SENSOR

Arthur C. Davidson, Davidsonville, and McLean M. Grant, Silver Spring, both of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 2, 1971, Ser. No. 111,998
Int. Cl. G01j 1/20
U.S. Cl. 250—203 R **22 Claims**

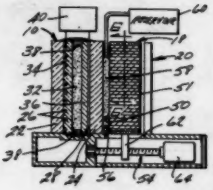


A system for sensing the attitude of a spacecraft includes a pair of optical scanners having a relatively narrow field of view rotating about the spacecraft *x-y* plane. The spacecraft rotates about its *z* axis at a relatively high angular velocity while one scanner rotates at low velocity, whereby a panoramic sweep of the entire celestial sphere is derived from the scanner. In the alternative, the scanner rotates at a relatively high angular velocity about the *x-y* plane while the spacecraft rotates at an extremely low rate or at zero angular velocity relative to its *z* axis to provide a rotating horizon scan. To avoid ambiguity while the spacecraft is spinning at an extremely low velocity or is stationary relative to its *z* axis, the scanners are successively activated during alternate scans. The positions of the scanners about the *x-y* plane are read out to assist in a determination of attitude. While the satellite is spinning at a relatively high angular velocity, the angular positions of the bodies detected by the scanners are determined relative to the sun by providing a sun detector having a field of view different from the scanners.

3,752,994
VISUAL DATA HANDLING SYSTEMS

John D. Grier, 1367 Meadowbrook Way, Temperance, Mich., and Harold E. Camp, 3221 Astor Pl., Toledo, Ohio

Division of Ser. No. 574, Jan. 5, 1970. This application June 25, 1971, Ser. No. 156,999
Int. Cl. H01l 17/00
U.S. Cl. 250—213 R **5 Claims**

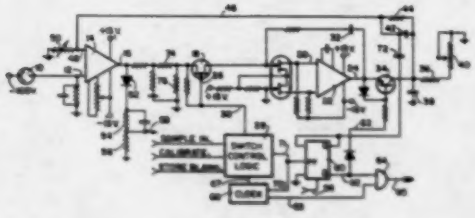


A visual data handling system incorporating a visual display device to provide an illuminated display of data. A print-through device utilizing a matrix of light conducting elements transfers the illuminated display of data to a light responsive type printer. This illumination transfer can be selectively interrupted by a turn-off mechanism, which does this by maneuvering the print-through device. Also, the light conducting elements can incorporate lasing devices to intensify the illumination.

3,752,995
BLANK VALUE STORING PHOTOMETER

Gerhard A. Liedholz, Miami, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed Apr. 7, 1972, Ser. No. 242,049
Int. Cl. H01j 39/12
U.S. Cl. 250—214 R **15 Claims**



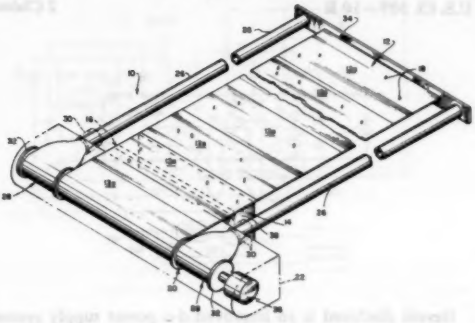
Circuitry which permits an externally supplied blanking solution, such as a serum blank, to be electronically stored for a long period of time, during which a calibration control solution and then a sequence of samples are applied to the photometer for calibration of the photometer and measurement of the sample in a logarithmic rundown mode. Specific subcircuits enhance the storing, calibrating and measuring operations.

3,752,996

METHOD OF AND DEVICE FOR DETERMINING THE CHARACTERISTICS AND FLUX DISTRIBUTION OF MICROMETEORITES

Hans F. Meissinger, Los Angeles, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Jan. 13, 1971, Ser. No. 106,106
Int. Cl. G01n 21/30
U.S. Cl. 250—219 DF 10 Claims



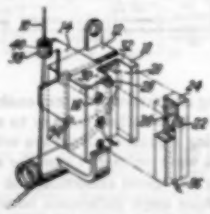
A micrometeroite impact sensing method of and device for determining the characteristics and flux distribution of micrometeroites by first exposing to the micrometeroite environment a panel of sheet material of a thickness to be punctured by impacting micrometeorites of given impact energy and then scanning the panel with a scanner which produces an output representing the number and size of the puncture holes in the panel. The disclosed inventive embodiment employs a panel of varying thickness which is exposed to the micrometeoric environment by deployment from a stowage container. After exposure, the panel is scanned for puncture holes by illuminating one side of the panel and retracting the panel into its stowage container past a photoelectric scanner which receives light through the panel holes as the latter travels across a scanning slit in the scanner and produces an output representing the incident light.

3,752,997

TENSION DETECTOR FOR STRING-LIKE ELEMENT

Fred T. MacKenzie, and Daniel W. Woodman, both of Beverly, Mass., assignors to USM Corporation, Boston, Mass.

Filed July 23, 1971, Ser. No. 165,040
Int. Cl. D02h 13/08
U.S. Cl. 250—219 S 2 Claims



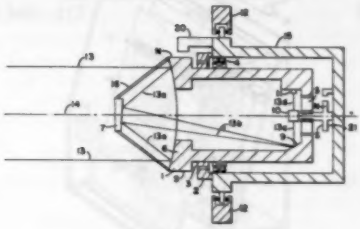
A detector responsive to the tension of a string-like element including a member having a portion for engaging the element, the member being movable between first and second positions in response to a tensile condition of the element to cause cooperative signal generating means to produce a detector signal.

3,752,998

LINEAR SCANNING SEEKER WITH SINGLE AXIS ROTATION

William W. Stripling, and Joe S. Hunter, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 1, 1972, Ser. No. 285,791
Int. Cl. G01c 9/02; G01d 5/34; G02b 17/00
U.S. Cl. 250—234 6 Claims



A linear scanning seeker with optical components mounted on a common rotational axis to facilitate field of view target area scanning without introducing unwanted precessional torques. The optical elements, with the exception of one prism, form an integral portion of a spinning gyroscopic mass. The seeker spin axis is defined by the gyroscopic mass spin axis. A parabolic primary mirror, which is cut into the face of the gyroscopic mass, and a slanted secondary mirror are positioned along the gyroscopic mass spin axis. A concave mirror and a prism are arranged to direct the incoming energy beam onto a detector in a direction orthogonal to the seeker spin axis. As the gyroscopic mass spins, energy beams from the seeker field of view are reflected off the primary, secondary, and concave mirrors. These energy beams are directed through the prism and scan the detector in a curved radial sweep pattern. The prism may be made to rotate in the same direction or in a direction opposite to the direction of spin of the gyroscopic mass. Rotating the prism in a direction opposite to the direction of the spinning gyroscopic mass increases the density of the curved radials. This same effect may be achieved by increasing the rotational speed of the gyroscopic spinning mass. In this invention, the gyroscopic mass and the prism are rotated about a common spin axis. This eliminates the necessity to counter rotate a mass to cancel the moment generated by the prism if it is not spun parallel to the seeker spin axis. A target is displayed on one of the beams when a target is present in the seeker field of view. Magnetic sensors react with magnets on the rotating gyroscopic mass and on the prism to indicate where a target is located in the seeker field of view when an image from the target is displayed on the detector.

3,752,999

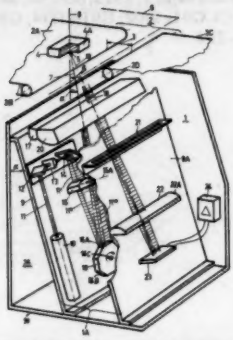
READING APPARATUS FOR OPTICALLY DISCERNIBLE CHARACTERS

Erwin Sick, Jcking; Gernot Pinior, Germering, and Johan Plockl, Unterhaching, all of Germany, assignors to Zellweger AG Apparate-Und Maschinenfabrik, Uster, Switzerland

Filed Jan. 28, 1972, Ser. No. 221,702
Claims priority, application Switzerland, Mar. 22, 1971, 4237/71
Int. Cl. G01n 21/30; G02b 17/00; G06m 7/00
U.S. Cl. 250—219 D 8 Claims

A reading apparatus for optically discernible characters, particularly optically discernible characters associated with an article and applied thereto or thereat comprising means for producing an optical transmitted light beam, a moved transmitted light beam directed towards a reference plane with regard to which the character to be read is arranged or moves within predetermined spatial limits departing from said transmitted light beam-producing means. Receiver means respon-

sive to changes in the reflected light receive a light beam reflected by the character. The means for producing the transmitted light beam is arranged such that a surface or plane in



which the transmitted beam moves prior to arriving at the character together with a perpendicular taken with regard to the reference plane encloses an angle which reduces specular reflections at the receiver means.

3,753,000

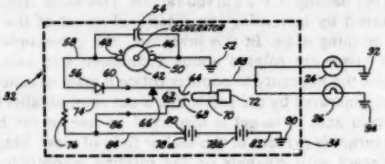
RECHARGEABLE LIGHTING SYSTEM FOR BICYCLES AND THE LIKE

James J. Newman, P.O. Drawer 579, Palm Desert, Calif.

Filed Mar. 9, 1972, Ser. No. 233,119

Int. Cl. H02g 3/00; H02j 7/00

U.S. Cl. 307—9 **15 Claims**



A plastic housing or casing contains a generator, diode, battery and a miniature jack for connection to the head and tail lights of a bicycle or motor bike. By means of a curved resilient strip or plate attached to the front fork of the bicycle a drive cone on the projecting end of the generator shaft is biased against the rim of the bicycle's front wheel. Two normally closed contacts in the jack connect the generator and diode through a current limiting resistor to the battery composed of two serially connected nickel-cadmium cells so that when the generator is rotated at a sufficient speed by the rim of the wheel, the battery is charged; when the wheel speed is too low, and the generator then not furnishing a sufficient charging voltage, the diode prevents the battery from discharging. When the two lamps, that is the head light and tail light, are to be lighted, the user inserts a plug connected to these two lamps into the jack to establish an electrical path directly from the diode to the lamps via the plug. The plug connection also establishes a parallel connection with the battery to assure energization of the lamps at low wheel speeds when there is an insufficient charging voltage or when the bicycle is completely stopped and the generator not providing any voltage at all.

3,753,001

ELECTRIC POWER SUPPLY SYSTEM USING BACK-UP CAPACITOR

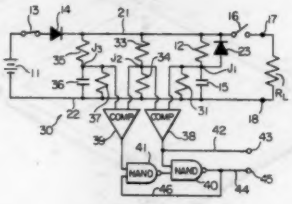
Minoru Hiroshima, Fumiyuki Inose, Sadao Kobayashi, Takashiro Iwasaki, all of Tokyo; Shizuhisa Watanabe, Katsuta, and Takahiko Tanigami, Mito, all of Japan, assignors to Nissan Motor Company, Limited, Kanagawa-ku, Yokohama City, Japan

Filed June 29, 1972, Ser. No. 267,359

Claims priority, application Japan, June 30, 1971, 46/47231

Int. Cl. H02j 1/06

U.S. Cl. 307—10 R **2 Claims**



Herein disclosed is an improved d-c power supply system which comprises a d-c power source, a first rectifier serially connected to the power source, and series connection composed of a protective resistor and a back-up capacitor, the series connection being connected across the first rectifier and the power source, and the protective resistor being bypassed by a second rectifier so that a discharge current from the back-up capacitor flows through the second rectifier. The power supply system further comprises means for producing information signals representing condition of the back-up capacitor.

3,753,002

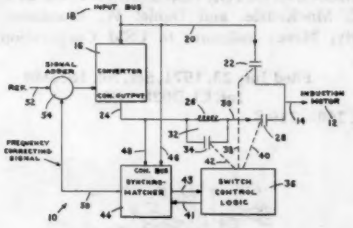
SYNCHRONIZING AND TRANSFER SYSTEM

Elton J. Jacobson, Hopkins, and Davis W. Schlicher, Richfield, both of Minn., assignor to Electric Machinery Manufacturing Company, Minneapolis, Minn.

Filed May 5, 1972, Ser. No. 250,576

Int. Cl. H02p 1/30

U.S. Cl. 307—87 **11 Claims**



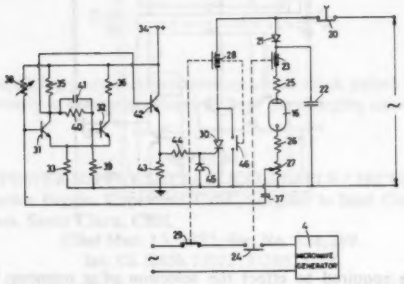
A synchronizing and transfer system enabling a fully loaded induction motor to be switched from or to a variable frequency converter having a quasi-square wave voltage, to or from a line having a sine wave voltage. Upon the motor to be transferred reaching a full-speed condition, the system senses the frequency and phase angle difference between the converter output and line and acts upon the converter frequency to decrease the difference. When the frequency and phase angle differences are within preset limits, load transfer switching is initiated. During the course of load transfer, an inductive impedance is transiently inserted in series with each phase of the converter output for a period of parallel feed, the impedance acting to prevent excessive cross currents from damaging the converter.

3,753,003

SAFETY DEVICE AGAINST RADIATION LEAKAGE FROM MICROWAVE APPARATUS

Lamberto Mazza, Prodenone, Italy, assignor to Industrie A. Zanussi S.P.A., Prodenone, Italy

Filed Oct. 5, 1971, Ser. No. 186,717
Claims priority, application Italy, Oct. 7, 1970, 30700 A/70
Int. Cl. H01h *35/00*
U.S. Cl. 307—117 7 Claims



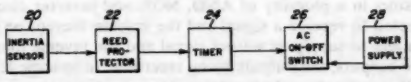
A safety device for microwave ovens is disclosed, which prevents radiation leakage from such an oven, the device being of the kind where a gas lamp is located in the area where radiation leakages may occur, said lamp being connected serially with a potentiometer which cooperates with a controlled diode which drives a relay which cuts the feed to the microwave generating circuit, the safety device being characterized by further comprising a bistable circuit and an amplifier which are connected to one another in cascade arrangement, the bistable circuit and the amplifier being inserted between the potentiometer voltage tap and the control electrode of the controlled diode. By such an arrangement, the sensitivity, the promptness and the reliability of the safety device of the kind described are considerably improved.

3,753,004

ELECTRIC TYPEWRITER AUTOMATIC ON-OFF SWITCH

Paul C. Dominic, Annandale, Va., assignor to Custom Electronic Devices, Inc., Alexandria, Va.

Filed June 16, 1971, Ser. No. 153,773
Int. Cl. H01h *35/00*
U.S. Cl. 307—121 17 Claims



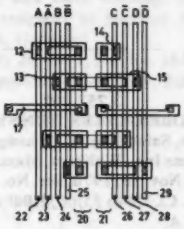
An Inertia Sensor with an oscillatory reed connectible upon actuation to reed protection circuitry, timing circuitry, AC switch circuitry, and power supply circuitry for turning on an electric typewriter upon actuation of the spacer bar and automatically turning off the typewriter after a predetermined time delay. Another embodiment discloses an impact sensor utilizing a vibration sensitive reed having a magnet thereon movable within a coil for creating an electromotive force for producing a signal which is amplified by amplifier circuitry, detected, and utilized to actuate timing circuitry and an on-off switch which is connected to a power supply.

3,753,005

INTEGRATED CIRCUIT COMPRISING STRIP-LIKE CONDUCTORS

Uwe Bertram, Hamburg; Hans Hoffman, Friedrichsgabe, and Hans Wilhelm Neuhaus, Hamburg, all of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 851,231, Aug. 19, 1969, abandoned.
This application June 3, 1971, Ser. No. 149,756
Claims priority, application Germany, Aug. 20, 1968, P 17 62 759.7
Int. Cl. H03k *19/08;* G08c *5/00*
U.S. Cl. 307—213 9 Claims



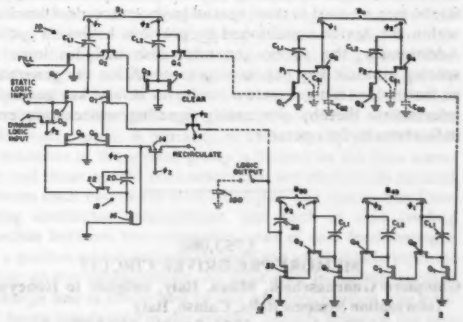
An integrated circuit using ETL gates especially useful for code conversion is described. All of the input transistors of the gate having interconnected emitters and interconnected collectors. The inputs are made to the base regions and are supplied by means of a series of parallel, strip-like conductors on top of the circuit and passing over the input transistors. At least some of the input transistors have elongated base regions which extend perpendicular to the direction of the strip conductors so as to locate the base contact for the base region directly underneath the conductor to which it is connected. Space is provided between the conductors for the emitter interconnections and for connection to a coupling resistor. The arrangement described avoids many of the crossovers of the input conductors required in the prior art arrangement.

3,753,006

HIGH SPEED, LOW POWER, DYNAMIC SHIFT REGISTER WITH SYNCHRONOUS LOGIC GATES

Robert H. Crawford, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 685,238, Nov. 13, 1967, Pat. No. 3,599,010, which is a continuation-in-part of Ser. No. 636,998, May 8, 1967, abandoned.
Filed Oct. 14, 1970, Ser. No. 80,786
Int. Cl. H03k *19/40*
U.S. Cl. 307—214 4 Claims



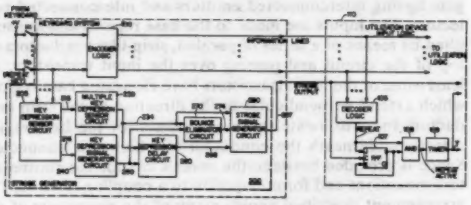
A shift register having a plurality of bits each formed by a pair of serially interconnected synchronous inverter stages operated by nonconcurrent clock pulses. Each inverter has an MOS transistor driver, a capacitive load, and a bilateral MOS transistor output. The shift register is in integrated circuit form on the (110) crystallographic plane with the current flow

in all transistors in a direction normal to the (110) crystallographic plane. The logic input is the gate of the MOS transistor driver. The clock pulses are sequentially applied to the two inverter stages so that the logic number is shifted through the bit in two steps. Each clock pulse is applied across the load and driver and also is applied to the gate of the output transistor of the respective stage. "Fill," "Clear," and "Recirculate" modes are provided by NAND and NOR logic gates formed in the first bit by connecting two or more MOS transistor drivers for the inverter stages in series or in parallel, respectively. The last stage of the last bit is a unique high speed D.C. buffer capable of driving a highly capacitive circuit external to the shift register at high speed.

3,753,007
STROBE GENERATION SYSTEM

G. R. Viswanathan, Saint Troy, N.Y., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Nov. 16, 1970, Ser. No. 89,914
Int. Cl. H04b 15/00; H04l 15/06
U.S. Cl. 307—247 A **19 Claims**



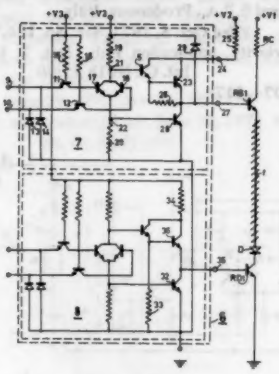
A strobe generator in response to a key depression generates a strobe which is not affected by contact bounce produced by depressing and releasing keys whereby the strobe signals when a utilization device may sample valid keyboard generated information. An accurate strobe interval is generated by utilizing a retriggerable logic circuit to produce a strobe only after contact bounce produced by depressing a key subsides. The width of the strobe is arranged to be a function of the length of time the key is depressed. Therefore, the strobe may be used to reset special keyboard control functions within the device conditioned by previous keyboard entries. Additionally, the strobe generator also includes logic for sensing multiple key depressions to condition the generation so that it does not generate a strobe for invalid key generated information thereby eliminating signaling unnecessary error indications to the operator.

3,753,008
MEMORY PRE-DRIVER CIRCUIT

Gianpiero Guarnaschelli, Milan, Italy, assignor to Honeywell Information Systems Italia, Caluso, Italy

Filed June 14, 1971, Ser. No. 152,930
Claims priority, application Italy, June 20, 1970, 26313 A/70
Int. Cl. H03k 19/34, 19/36; G11c 11/34
U.S. Cl. 307—270 **10 Claims**

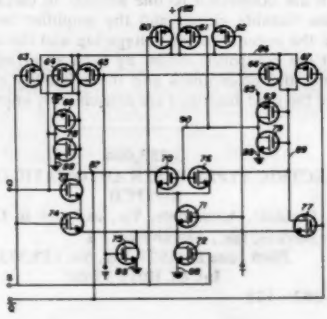
A low power dissipating monolithic integrated core memory driver circuit for driving memory line transistor switches. The circuit is supplied with two distinct voltage levels and a control circuit responsive to input signals for processing the proper voltage required to effect the selection of a memory line without overloading the integrated driver circuit.



3,753,009
RESETTABLE BINARY FLIP-FLOP OF THE SEMICONDUCTOR TYPE

Steven L. Clapper, Fort Lauderdale, Fla., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Aug. 23, 1971, Ser. No. 173,894
Int. Cl. H03k 3/26
U.S. Cl. 307—279 **10 Claims**



A bistable flip-flop circuit utilizing insulated gate field effect transistors in a plurality of AND, NOR and inverter circuits connected to receive a signal and the inverse thereof on two inputs and to supply an output signal and the inverse thereof on two outputs, the outputs being resettable to specific levels upon the application of a reset signal to a reset input.

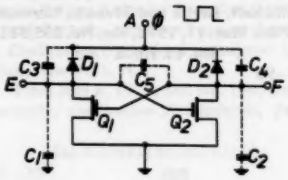
3,753,010
ELECTRIC DYNAMICALLY OPERATED STORAGE ELEMENT

Tegze Haraszti, Heilbronn, Germany, assignor to Lincentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Germany

Filed Aug. 10, 1971, Ser. No. 170,509
Claims priority, application Germany, Aug. 10, 1970, P 20 39 606.9; Aug. 10, 1970, P 70 29 971.7
Int. Cl. H03k 3/286
U.S. Cl. 307—279 **15 Claims**

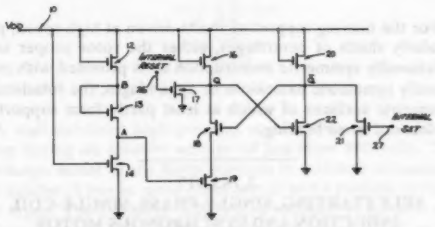
An electric dynamically operated storage element comprises two energy stores. Each store has a charging circuit including a rectifying element and a discharging circuit includ-

ing a controlled respectively variable resistance connected in series with the rectifying element. Also, circuitry is provided



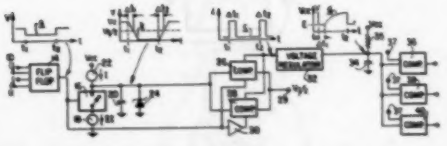
for applying periodically repeating phase clock pulses simultaneously to the energy stores through the charging circuits.

3,753,011
POWER SUPPLY SETTABLE BI-STABLE CIRCUIT
Federico Faggin, Cupertino, Calif., assignor to Intel Corporation, Santa Clara, Calif.
Filed Mar. 13, 1972, Ser. No. 234,259
Int. Cl. H03k *17/22, 3/286, 3/33*
U.S. Cl. 307—247 R **10 Claims**



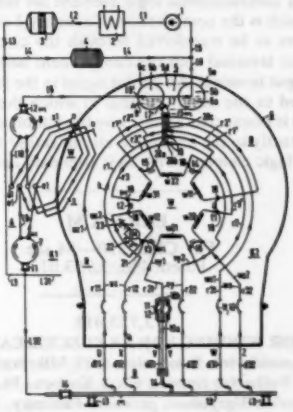
A circuit for setting a bi-stable circuit such as a flip-flop in a predetermined state when power is applied to the bi-stable circuit is disclosed. The circuit is fabricated using MOS technology and does not require the fabrication of an RC circuit.

3,753,012
CIRCUIT FOR PROVIDING PRECISE TIME DELAY
Thomas M. Frederiksen, San Jose, Calif.; William F. Davis, Tempe, and Ronald W. Russell, Mesa, both of Ariz., assignors to Motorola, Inc., Franklin Park, Ill.
Filed Feb. 17, 1972, Ser. No. 227,166
Int. Cl. H03k *5/13*
U.S. Cl. 307—293 **11 Claims**



Integrated circuit structure responsive to being triggered to produce output signals at precise time intervals following points in the operation of a device. The circuit is adapted for accurate repeating operation, and provides a plurality of signals at different precise time delays. A discrete capacitor is discharged to a predetermined value (reset) by a voltage regulator at each triggering of the circuit, and at the end of a short time starts to charge so that the voltage thereacross forms a repeatable exponential ramp. A plurality of comparators are coupled to the capacitor and each produces an output when the capacitor voltage reaches the reference voltage for that comparator. The triggering may be provided by a circuit including a reset capacitor which responds to the change of levels of a signal derived from the device to alternately charge and discharge the reset capacitor. The voltage across the reset capacitor is applied to a pair of comparators which produce current pulses during the beginning of the charge and discharge periods of the reset capacitor for operating the voltage regulator.

3,753,013
LIQUID-COOLED ELECTRIC MACHINE, PARTICULARLY TURBO-GENERATOR
Heinrich Beermann, and Hans Lenting, both of Mulheim-Ruhr, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany
Filed July 20, 1971, Ser. No. 164,367
Claims priority, application Germany, July 30, 1970, P 20 37 794.0
Int. Cl. H02k *9/00*
U.S. Cl. 310—54 **5 Claims**



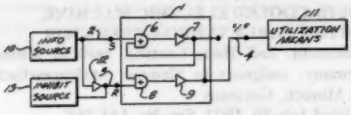
A liquid-cooled electric machine, such as a turbo-generator, has a stator with a multi-phase double-layer lap winding composed of winding portions, main current feed-throughs, and circuit connectors. The circuit connectors form electric circuit-group connections between the winding portions and also connect the winding portions with the feed-throughs. The stator comprises a liquid-coolant system which has two hydraulically parallel connected branch groups of coolant ducts. A first one of these duct groups extends through the multi-phase winding. The second branch group of ducts extends through the feed-throughs and the connectors. Insulating hose members form part of the second branch group and fluidically bridge each two of those connectors that have instantaneous potentials, i.e. have different electrical potentials or assertain to different phases. A plurality of hydraulically parallel cooling branches of the second group is formed by the hose members and those of said connectors that are electrically located between each two of the feed-throughs. The connectors form a ring conductor arrangement, and each of said cooling branches between two respective ones of said feed-throughs has a portion which extends through the geodetically topmost region of the arrangement. At least one insulating coolant discharge line is connected to this topmost portion, the coolant being conducted in the cooling branch between the two feed-throughs and the associated discharge line in double-stream fashion. A coolant collector tank with an internal gas cushion space is mounted geodetically above the topmost ring conductor portion. The coolant discharge line forms a riser communicating from below with said tank so as to pass not only coolant but, due to buoyancy, also entrained undissolved gas into the tank.

3,753,014

FAST INHIBIT GATE WITH APPLICATIONS

Reinhard Kurt Kronies, Glendora, and John Robert Coupland, El Monte, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Mar. 15, 1971, Ser. No. 124,415
Int. Cl. H03k 19/20, 19/38
U.S. Cl. 307—217 3 Claims



An electronic circuit that has two input terminals and is responsive to three combinations of binary input signals is useful as a fast inhibit gate. The electronic circuit functions as an RS flip-flop for two of the combinations of binary input signals and as a combinational logic element for the third combination, which is the combination of a binary 1 on each input. Binary data to be transferred through the circuit is applied to one input terminal with the complement being applied to the other input terminal. An inhibit signal in the form of a binary 1 is applied to the same terminal to which the complement of the data is connected. In this way the inhibit signal may be applied directly to the electronic circuit rather than through additional logic elements with their attendant delay.

ERRATUM

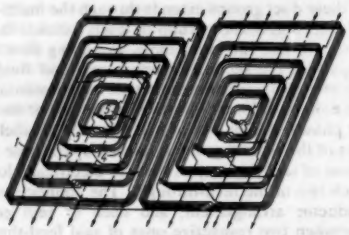
For Class 310—54 see:
Patent No. 3,753,013

3,753,015

ROTOR WINDING FOR AN ELECTRICAL MACHINE

Boris Leonidovich Konovalov, 603 Mikroraion, I, kv. 346; Boris Volkovich Spivak, ulitsa Kosiora, 56, kv. 55; Leonid Vasilievich Ugrjumov, pereulok Faninsky, 3, kv. 39; Alexandr Abramovich Chigirinsky, ulitsa Kuibysheva, II, kv. 8; Evgeny Khaimovich Glider, prospekt Ordzhonikidze, 18, kv. 55; Oleg Borisovich Gradov, ulitsa Kosiora, 6, kv. I, and David Bentsionovich Karpman, ulitsa Frantisheka Krala, 49, kv. 54, all of Kharkov, U.S.S.R.

Filed Mar. 29, 1971, Ser. No. 128,853
Int. Cl. H02k 1/32
U.S. Cl. 310—64 1 Claim



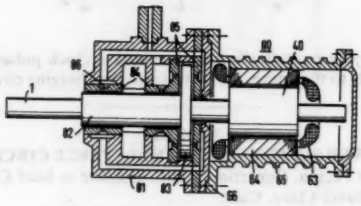
Liquid-cooled rotor windings for turbo-alternators including an electrical-machine rotor winding with internally liquid-cooled conductors composed of a number of concentrically arranged coils, in which the cooling-liquid inlet and outlet taps are located between the coils in the coil ends of the winding, and the bends of the coils whereto said taps are connected are made more gradual than the adjacent bends of the next coils, while being made more gradual are the bends of turns of the coils placed below the turns of the coils onto which the taps are connected.

3,753,016

BEARING SYSTEM FOR SHAFTS DRIVEN BY AN ELECTRIC MOTOR

Gerald Klein, Ruckersdorf, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Mar. 17, 1972, Ser. No. 235,511
Int. Cl. H02k 7/08
U.S. Cl. 310—90 1 Claim



For the bearing support of shafts driven at high speed, particularly shafts of centrifuges, either the rotor proper is of rotationally symmetric construction or is provided with rotationally symmetric extensions or appendages, the rotationally symmetric surfaces of which at least partly form supporting surfaces of an air bearing.

3,753,017

SELF STARTING, SINGLE-PHASE, SINGLE-COIL INDUCTION AND SYNCHRONOUS MOTOR

Max Alth, 6 Tamarack Rd., Port Chester, N.Y.

Filed Feb. 25, 1972, Ser. No. 229,265
Int. Cl. H02k 19/14
U.S. Cl. 310—163 10 Claims

The rotor may comprise a solid conductive disc, a slotted conductive disc, a conductive disc with a plurality of iron cores or permanent magnets equally spaced within the perimeter of said disc.

The stator is a solenoid with an iron core and two iron arms, parallel to each other, positioned above and below the rotor; the arms forming an almost complete circle within and following the perimeter of the rotor.

An AC field, originating within the solenoid, travels to the end of the solenoid's core arms. The flux lines are parallel to the rotor shaft and set up an apposing field within the conductive rotor causing it to rotate. Poles within the rotor sync with the ends of the core arms.

3,753,018

WALL-STABILIZED HIGH-PRESSURE MERCURY AND METAL IODIDE VAPOUR DISCHARGE LAMP WITH OUTER ENVELOPE

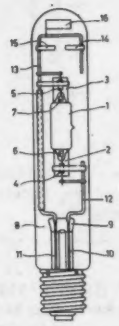
Louis Benjamin Beijer; Antonius Jozephus Gerardus Cornelis Driessen, and Cornelis Adrianus Joannes Jacobs, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 8, 1971, Ser. No. 160,656

Claims priority, application Netherlands, July 31, 1970, 7011321

Int. Cl. H01j *61/26, 61/34*

U.S. Cl. 313—25 4 Claims



A wall-stabilised high-pressure mercury vapour discharge lamp having an ignition voltage of less than 500 volts. The discharge vessel of the lamp contains in addition to mercury the iodides of one or more other metals and a mixture of neon and argon. The discharge vessels is surrounded by an outer envelope which is filled with a mixture of nitrogen and neon. Furthermore a selective hydrogen getter is present within the outer envelope.

3,753,019

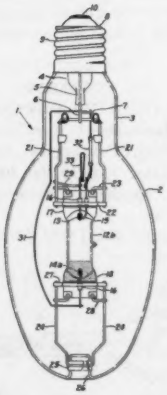
METAL HALIDE LAMP

Wayne R. Hellman, Euclid, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 5,759, Jan. 26, 1970, abandoned. This application Jan. 31, 1972, Ser. No. 222,253

Int. Cl. H01j *61/22*

U.S. Cl. 313—47 10 Claims



A high pressure metal halide discharge lamp containing mercury and metal halides including an alkali metal halide and wherein the segregation of alkali metal (sodium) is minimized. In a lamp for vertical operation, the normally asymmetric alkali metal distribution in the vapor phase is offset or reduced by an asymmetric lamp construction using at the lower end one or more of a smaller electrode which runs hotter, a heat-reflecting coating, or a tapered end chamber. This construction drives the condensed metal halides away from the lower end while raising the temperature of the excess halide, and exerts a net force on the alkali metal atoms in the vapor phase to drive them toward the upper end of the lamp. The result is that segregation of the alkali metal is reduced, leading to higher efficiency, improved color and reduced color separation.

3,753,020

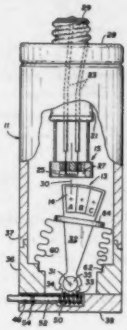
MULTI-ANODE X-RAY TUBE

William P. Zingaro, Hartsdale, N.Y., assignor to Philips Electronics and Pharmaceutical Industries, New York, N.Y.

Filed Nov. 26, 1971, Ser. No. 202,438

Int. Cl. H01j *35/10*

U.S. Cl. 313—60 6 Claims



A plurality of anodes in an X-ray tube are each disposed at the circumferential portion of adjacent sectors having a common center which is concentric with a gear nonmovable fitted to the sectors. The gear is in mating arrangement with a worm screw for permitting selection of one of the anodes to be in line with a stream of electrons from the cathode.

3,753,021

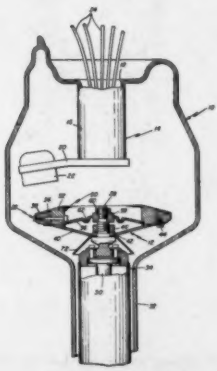
X-RAY TUBE ANODE TARGET

Martin Braun, Stamford, Conn., assignor to The Machlett Laboratories, Incorporated, Springdale, Conn.

Filed Apr. 3, 1972, Ser. No. 240,713

Int. Cl. H01j *35/10*

U.S. Cl. 313—60 7 Claims



An X-ray tube having a rotating anode comprising a target which is provided with improved heat dissipation charac-

teristics by means of an X-ray generating member and an associated heat sink of high thermal storage capacity material which during operation of the tube more closely engages the X-ray generating member for providing efficient thermal conductivity therebetween.

3,753,022

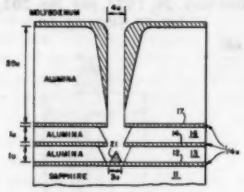
MINIATURE, DIRECTED, ELECTRON-BEAM SOURCE

Donald L. Fraser, Jr., Laurel, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 26, 1971, Ser. No. 137,299

Int. Cl. H01j *29/74, 1/90*

U.S. Cl. 313—78 **7 Claims**



A miniature, directed, electron-beam source, consisting of a conventional field emission source with an associated first anode plate, and several deposited layers of alumina and molybdenum for focusing and deflecting the electron beam, the deposited layers having a column etched through them to the field emission source.

3,753,023

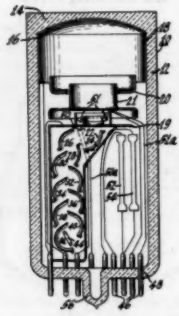
ELECTRON EMISSIVE DEVICE INCORPORATING A SECONDARY ELECTRON EMITTING MATERIAL OF ANTIMONY ACTIVATED WITH POTASSIUM AND CESIUM

Alfred Hermann Sommer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 34,699, May 5, 1970, abandoned. This application Dec. 3, 1971, Ser. No. 204,697

Int. Cl. H01j *43/00*

U.S. Cl. 313—103 **5 Claims**



In an electron emissive device having electron multiplying dynodes, the dynode surfaces upon which the electrons impinge are provided with a layer of antimony activated with cesium and potassium.

3,753,024

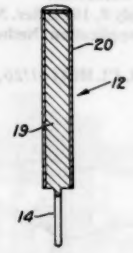
GLOW LAMP WITH NICKEL-PLATED ELECTRODES

Egon Vical, Richmond Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 20, 1972, Ser. No. 236,399

Int. Cl. H01j *61/06*

U.S. Cl. 313—217 **3 Claims**



A glow discharge device is provided with nickel-plated steel electrodes. The nickel plating thickness and steel composition vary within certain limits.

3,753,025

INDIRECTLY HEATED SUPPLY CATHODE

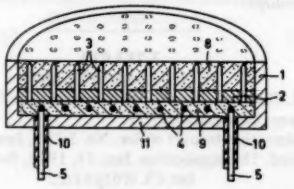
Antonius Johannes Alberta Van Stratum; Simon Lambertur Loyen, and Johannes Gerardus Van Os, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 1, 1971, Ser. No. 203,705

Claims priority, application Netherlands, Dec. 10, 1970, 7018001

Int. Cl. H01j *1/88, 19/42, 1/26*

U.S. Cl. 313—270 **3 Claims**



A supply cathode having a large diameter in which the emissive body is supported by a metal base plate having metal pins which are embedded in the sintered emissive body.

3,753,026

QUARTZ LAMP SEAL

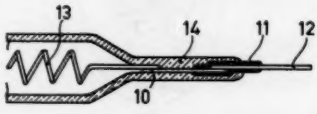
Jan Goorissen, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 7, 1970, Ser. No. 95,436

Claims priority, application Netherlands, Dec. 13, 1969, 6918746

Int. Cl. H01j *5/38, 5/46, 5/52*

U.S. Cl. 313—318 **4 Claims**



An electric lamp including an envelope of quartz glass in which at least part of the metal components sealed in the pinch is coated with SiO_2.

3,753,027

DISCHARGE LAMP ARRANGEMENT

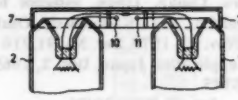
Dirk Kolkman, Emmasingel, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 22, 1971, Ser. No. 117,508

Claims priority, application Netherlands, Mar. 20, 1970, 7003970

Int. Cl. H01j 5/50

U.S. Cl. 313—318 8 Claims



A lamp comprising a composition of two or more parallel arranged fluorescent lamps whose ends are rigidly connected together.

3,753,028

DISCHARGE LAMP ELECTRODE

Yves Renaud, Puteaux, France, assignor to Compagnie Des Lampes, Paris, France

Filed Apr. 27, 1971, Ser. No. 137,818

Claims priority, application France, May 22, 1970, 7018756; Apr. 7, 1971, 7112325

Int. Cl. H01j 1/14, 19/06

U.S. Cl. 313—346 R 18 Claims

This discharge lamp electrode comprises a cylindrical tungsten rod having fitted and welded to its upper end a coil of spiral-wound wire of the same metal and two small disks, i.e. a thorium emitting disk and a titanium-emitting disk disposed above the end of the cylindrical tungsten rod; the thorium emitting disks consists of tungsten powder sintered under a relatively high pressure to constitute a skeleton, and the titanium emitting disk consists of a tungsten skeleton in which titanium is incorporated; other coils of spiral-wound tungsten wire are disposed around said disks and locked in position by weld spots.

3,753,029

CATHODE RAY TUBE INCLUDING VARIABLE DELAY MEANS

Gerard Kantorowicz, Paris, France, assignor to Thomson-CSF, Paris, France

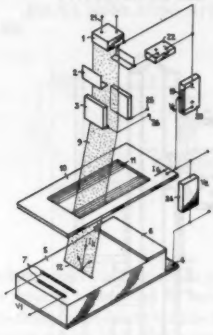
Filed Nov. 15, 1971, Ser. No. 198,585

Claims priority, application France, Nov. 17, 1970, 70/41170

Int. Cl. H01j 23/24, 29/96, 29/41

U.S. Cl. 315—3 2 Claims

The delay line comprises a piezoelectric material wafer with an input transducer for converting the electrical wave to be delayed into a mechanical one propagating along the wafer and a movable output pick-up means. This pick-up means comprises an electron beam striking the wafer and producing therefrom secondary electrons with a secondary emission coefficient greater than unity, and a two-wire line made of two plane and parallel electrodes between which the wafer is inserted, that one of the two electrodes through which the electron beam passes being a grid collecting the emitted secondary electrons. The electrical signal thus apparing between the two leads of the two-wire line is a reproduction of the high frequency input wave delayed by a time depending upon the position of the electron beam along the wafer.



3,753,030

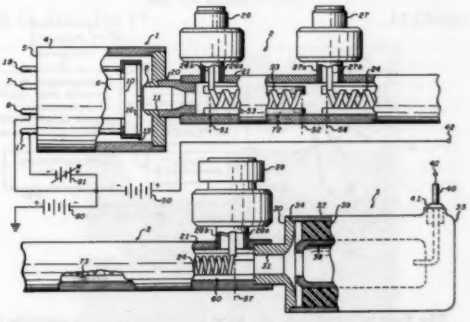
GAIN COMPENSATED TRAVELING WAVE TUBE

William K. McManus, Gainesville, Fla., assignor to Sperry Rand Corporation, New York, N.Y.

Filed June 1, 1972, Ser. No. 258,672

Int. Cl. H01j 25/34

U.S. Cl. 315—3.6 8 Claims



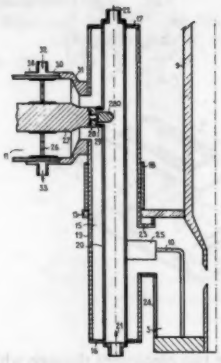
A dual-helix slow wave traveling wave tube has successive amplification sections associated with first and second input transmission lines, the first amplification section compensating for the high frequency power deficiencies of the second amplification section when the amplifier is operated over a wide range of input power levels.

3,753,031

OUTPUT DEVICES FOR MICROWAVE TUBES SUCH AS KLYSTRONS, AND KLYSTRONS INCORPORATING SUCH OUTPUT DEVICES

Paul Aucouturier, and Jean Hervier, both of Paris 8e, France, assignors to Thomson-CSF, Paris, France

Filed Apr. 26, 1972, Ser. No. 247,745
Claims priority, application France, May 18, 1971, 7117977
Int. Cl. H01j 25/10
U.S. Cl. 315—5.39 6 Claims



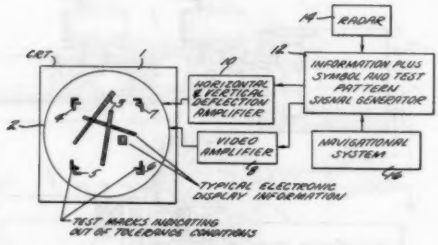
Output devices for microwave tubes such as klystrons comprising an auxiliary coaxial line parallel to the direction of the electron beam in the tube, and connected between the output coupling loop which picks off the power from the tube, and a coaxial line section which constitutes the output line to which the load circuit is connected. The length of said auxiliary coaxial line determines the location of the output section. This device can in particular be used in klystrons and especially klystrons employing magnetic focussing.

3,753,032

CRT WITH BUILT-IN DISPLAY REGISTRATION TEST

Herbert H. Naidich, Stamford, Conn., and John J. Boncer, Carlsbad, Calif., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed July 27, 1971, Ser. No. 166,527
Int. Cl. H01j 29/06
U.S. Cl. 315—18 4 Claims



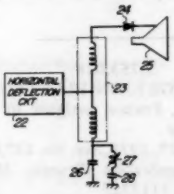
The face of a cathode ray tube is treated so as to provide inactive areas thereon, either by having the face of the CRT opaqued before the deposition of phosphor thereon, or by having the phospor selectively removed, such as by etching or scribing, in any desired configuration. The inactive areas are in the form of simple check symbols which may be continuously generated, said symbols being invisible so long as complete registration occurs, and become visible so as to indicate fault, whenever the registration or symbol generation apparatus driving the CRT fails to operate within tolerance. Flashing symbols may be utilized to direct attention to the loss of registration, and a purposeful misregistration may be introduced in the system to test for the generation of the normally invisible check symbols. The inactive areas may be sufficiently fine so as not to detract from other displayed information during normal system operation.

3,753,033

HIGH-VOLTAGE STABILIZER

Yoshinori Kitamura, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma-shi, Osaka, Japan

Filed Nov. 23, 1970, Ser. No. 91,710
Claims priority, application Japan, Dec. 2, 1969, 44/97410; Dec. 6, 1969, 44/98145
Int. Cl. H01j 29/70
U.S. Cl. 315—29 8 Claims



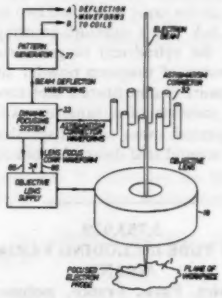
A horizontal deflection circuit is connected with a series resonance circuit consisting of a boosting transformer and a capacitor, said series resonance circuit being appropriately resonated to generate resonance pulses other than pulses which are generated upon cutting off a switching element inserted in said horizontal deflection circuit, thereby to stabilize a high voltage.

3,753,034

ELECTRON BEAM APPARATUS

Denis Frank Spicer, Putnoe, Bedford, England, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 30, 1970, Ser. No. 76,875
Claims priority, application Great Britain, Oct. 10, 1969, 49919/69
Int. Cl. H01j 29/56
U.S. Cl. 315—31 R 19 Claims



An electron beam apparatus is provided, including means for producing an electron beam in combination with an electron lens for focussing the beam and means for deflecting the beam in two directions. A signal derived from the deflecting signals is applied to the lens for correcting for the curvature of the surface described by the focus of the beam during deflection, and is also applied to means for correcting astigmatism of the electron lens.

3,753,035

ELECTRON-BEAM TUBE AS SYMBOL-PRINTING TUBE

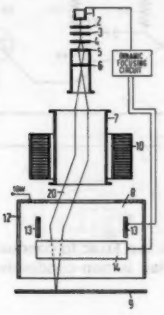
Werner Veith, Munich 80, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Sept. 16, 1070, Ser. No. 72,594

Claims priority, application Germany, Sept. 23, 1969, P 19 48 153.9

Int. Cl. H01j *29/56*

U.S. Cl. 315—31 R 4 Claims



An electron tube for the continuous translation of electrical data into characters of scanning pattern points to be reproduced on a fluorescent screen, preferably an ultraviolet screen, employs a raster structure of insulated metal strips which may be scanned to determine the data passing the raster structure in the form of electron beams. Cylindrical lenses are employed in the raster structure to overcome distortions at the edges of the picture.

3,753,036

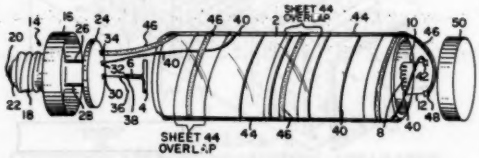
INTEGRATED FLUORESCENT LAMP UNIT

William J. Roche, Danver, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed May 3, 1971, Ser. No. 139,551

Int. Cl. H01j *17/30*

U.S. Cl. 315—60 7 Claims



A fluorescent lamp unit having integral starting and ballasting circuitry. Attached to one end of the lamp is a screw-in base containing a solid state starting circuit module. Ballasting is provided by a resistance wire series connected between the starting circuit and the cathode electrode of the lamp and spiralled about the lamp tube in a manner providing a thermal gradient. A strip of clear plastic insulating material is helically wrapped about the wire wound lamp, and cathode preheating can be provided through a strip of conductive tape connected between the starting circuit and one terminal of the cathode and helically wrapped about the lamp within overlaps of the strip of plastic insulating material.

3,753,037

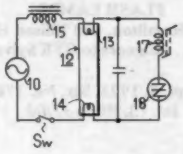
DISCHARGE-LAMP OPERATING DEVICE USING THYRISTOR OSCILLATING CIRCUIT

Isao Kaneda, and Kiyokazu Takeuchi, both of Osaka, Japan, assignors to New Nippon Electric Company Ltd., Kita-ku, Osaka, Japan

Continuation-in-part of Ser. No. 14,325, Feb. 26, 1970, Pat. No. 3,665,243. This application Nov. 29, 1971, Ser. No. 202,766

Int. Cl. H05b *37/00*, *41/23*

U.S. Cl. 315—99 15 Claims



A discharge-lamp operating device is provided which comprises a power source connected in series with a discharge lamp and arc discharge stabilizing means of the linear inductor type, and a starting device including a capacitor connected in parallel with the discharge lamp and a series circuit including a voltage responsive switching element or a symmetrical switch element such as a bidirectional diode thyristor and a saturable non-linear inductor connected in parallel with the discharge lamp. Each filament of the discharge lamp is preferably interposed between the capacitor and the series circuit for improved preheating of the filaments. In addition, a bias coil which is magnetically coupled with the saturable nonlinear inductor can be connected in series with the capacitor to control oscillating frequency and voltage of the starting device. Further, there can be provided a second bias coil in series with the linear inductor so as to obtain desired effects according to the connections of the first and/or second bias coils which are magnetically coupled with the saturable nonlinear inductor.

3,753,038

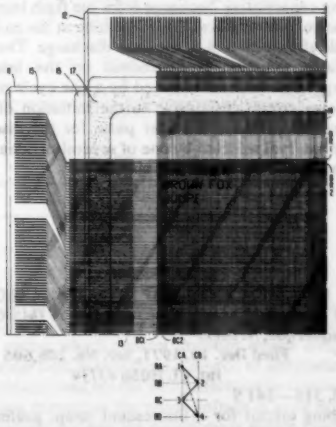
METHOD AND APPARATUS FOR OPERATING ROW-COLUMN MATRIX PANELS AND DEVICES

David E. Liddle, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 11, 1970, Ser. No. 97,307

Int. Cl. H05b *37/00*

U.S. Cl. 315—169 TV 15 Claims



There is disclosed a method and apparatus for reducing or eliminating differential line aging on gaseous discharge dis-

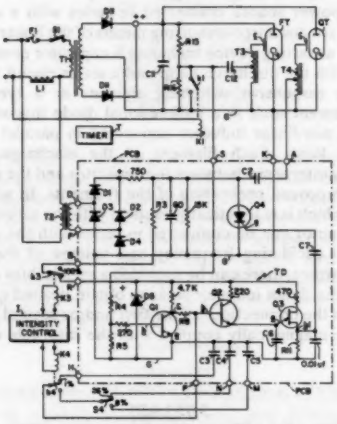
play/memory panels. For a given size N × M grid or point pattern the use or incidence rate of each point is determined by applying normal patterns of characters thereto. The row-column conductor arrays forming matrix cross-points locating a discrete discharge site are shifted so as to assure that the positions in the dot matrix are more evenly utilized.

3,753,039

CONTROL CIRCUIT FOR VARYING THE INTENSITY OF FLASH LAMPS

Robert P. Bonazoli, Hamilton, and Ellison H. Kirkhuff, Needham, both of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Sept. 8, 1971, Ser. No. 178,628
Int. Cl. H05b *37/00*
U.S. Cl. 315—227 **17 Claims**



In an airport runway flashing light beacon system the intensity of emission of individual xenon flash lamps is varied by shunting capacitative discharge from the flash lamp to a lower impedance, non-emissive discharge tube at the end of selected intervals after initiation of the flash discharge. The intensity of flash lamp emission is dependent on the interval of its discharge. This interval is varied by a one cycle multivibrator time delay circuit responsive to the initiation of flash lamp discharge to produce a trigger pulse for the discharge tube after an interval selected by one of several switchable resistors or capacitors in the time delay circuit.

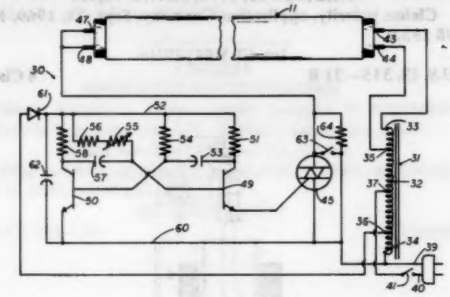
3,753,040

FLUORESCENT LAMP STROBING CIRCUIT

Robert Quenelle, Tucson, Ariz., assignor to IMS Corporation, Albuquerque, N. Mex.

Filed Dec. 10, 1971, Ser. No. 206,606
Int. Cl. H05b *41/34*
U.S. Cl. 315—241 S **9 Claims**

Strobing circuit for a fluorescent lamp, preferably an ultraviolet lamp, wherein a Triac connects the lamp to a ballast winding, the Triac being controlled by a two transistor multivibrator supplied with DC voltage through a diode connected to a tap of the ballast winding. The resistor is connected in parallel with the Triac to conduct a small amount of current when the Triac is non-conductive and to keep the lamp ionized.

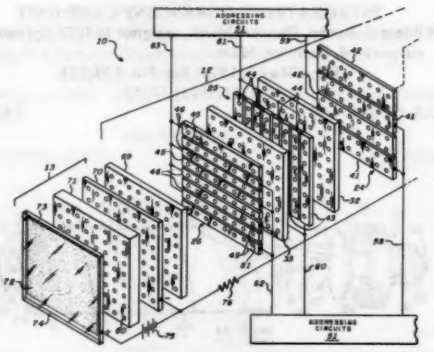


3,753,041

DIGITALLY ADDRESSABLE GAS DISCHARGE DISPLAY APPARATUS

Claude D. Lustig, Lexington, and Albert W. Baird, III, Burlington, both of Mass., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Nov. 18, 1970, Ser. No. 90,538
Int. Cl. H05b *37/00*
U.S. Cl. 315—169 TV **17 Claims**



A digitally addressable gas discharge display including a reservoir for providing ionizable gas and a plurality of gas discharge display cells. The device includes a plurality of addressing electrodes each having a plurality of apertures therethrough. The addressing electrodes are arranged in stacked configuration so that the apertures are aligned to form gas conductive channels extending from the reservoir to the display cells, respectively. The addressing electrodes are adapted for selective connection to sources of electrical potential whereby gas discharge columns are extended from the reservoir through selected channels thereby igniting gas discharges in selected display cells.

3,753,042
APPARATUS FOR THE CURRENT LIMITING INTERRUPTION OF CURRENTS AT HIGH VOLTAGES

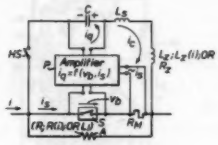
Dieter Kind, Pockelstrasse 4; Hagen Hartel, both of Braunschweig; Jurgen Salge, Salzgitter-Osterlinde, and Rudolf Brilka, Salzgitter-Lebenstedt, all of Germany, assignors to said Kind, by said Hartel, Salge, and Brilka

Filed Aug. 4, 1971, Ser. No. 168,967

Claims priority, application Germany, Aug. 4, 1970, P 20 38 624.7

Int. Cl. H02h 7/22

U.S. Cl. 317—11 A 10 Claims



An improved circuit for the current limiting interruption of currents in a power main at high voltages of the type wherein an energy absorbing circuit and a capacitor are each connected across the interrupter or commutation switch, and the capacitor is precharged so that upon opening of the switch the discharge current of the capacitor will oppose the current flowing through the switch and cause it to flow through the energy absorbing circuit. Circuit means are provided which causes charging of the capacitor only during the opening of the interrupter switch to a value which is dependent on the arc voltage at the interrupter switch and/or the current in the main so that sufficient time is available to the switch during the commutation phase to increase its arc resistance to an extent sufficient to commutate the main current into the parallelly connected capacitor and accordingly into the energy absorber and prevent the main current from commutating back into the switch.

3,753,043
CONDITION RESPONSIVE CONTROL APPARATUS

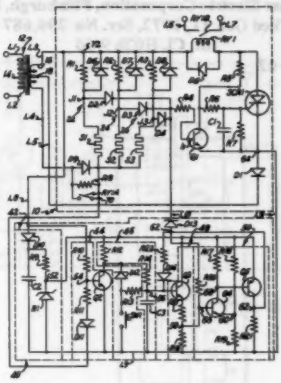
Leo A. Plouffe, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 12, 1972, Ser. No. 243,327

Int. Cl. H02h 7/08

U.S. Cl. 317—13 A 19 Claims

A circuit is disclosed for determining, after a predetermined period of time has elapsed following the energization of a load, such as an air-conditioning compressor, whether a certain condition exists, such as whether operating oil pressure level has been reached in the compressor, and for shutting down and locking out the air-conditioning system if the condition does not exist. The circuit is reset either by removing power therefrom or by actuating a push button switch. In one embodiment a pressure switch is employed to determine the oil pressure level while in another embodiment a temperature dependent resistor is used to determine the presence of the oil. The circuit can be used in conjunction with another circuit for controlling the energization of the compressor motor dependent upon the temperature of the winding of the motor or other desired parameters to be monitored.



3,753,044
PHASE FIRING CIRCUITS

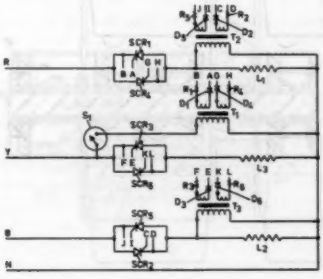
Collin John Hawker, Broadmayne, near Dorchester; Wilfred Roy Curle, Martock, and Harold David Read, East Coker, all of England, assignors to Westland Aircraft Limited, Yeovil, Somerset, England

Filed June 19, 1972, Ser. No. 263,952

Claims priority, application Great Britain, July 5, 1971, 31,479/71

Int. Cl. H02h 7/22

U.S. Cl. 317—33 SC 15 Claims



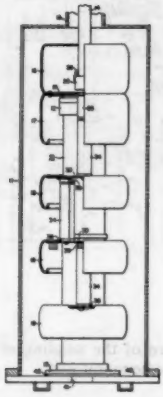
A control circuit for switching single or polyphase electrical supplies, wherein actuation of a single pole switch energises transformer means which control thyristor means adapted to supply electrical load means from a source of alternating current, the electrical load means being electrically connected to said alternating current as the phase voltage is at or near zero volts, in polyphase systems the transformer means controlling thyristor in preceding or succeeding phases, and each phase having a transformer means and thyristor means.

3,753,045

SHIELDED METAL ENCLOSED LIGHTNING ARRESTER

Norman K. Osmundsen; John E. Harder, both of Bloomington, Ind., and Tohei Nitta, Hyogo, Japan, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 11, 1972, Ser. No. 296,687
Int. Cl. H02h *9/06*
U.S. Cl. 317—62 **7 Claims**



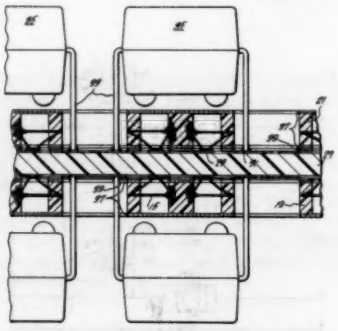
A high voltage lightning arrester enclosed in a grounded metal enclosure containing a pressurized insulating gas. The arrester is provided with capacitance grading means to control the voltage distribution across the arrester.

3,753,046

MULTI-LAYER PRINTED CIRCUIT BOARD

Leroy D. Towell, Dallas, Tex., assignor to University Computing Company, Dallas, Tex.

Filed Nov. 3, 1971, Ser. No. 195,434
Int. Cl. H05k *1/04*
U.S. Cl. 317—101 CM **18 Claims**



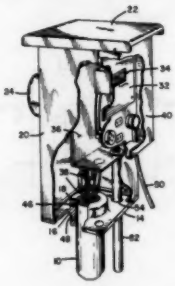
A method and apparatus is disclosed for routing and interconnecting insulated wire to selected areas on a printed circuit board. The apparatus comprises a printed circuit board having land pads located thereon. A wire mat, comprising a quantity of routed wire encapsulated within a layer of photopolymer material, is adapted to extend over the circuit board. The wire mat also includes a plurality of windows formed in areas extending over the land pads in order to permit the wire exposed in those areas to be reflow soldered to the registering land pads. The method of forming the wire mat and the multi-layer printed circuit board comprises the steps of prerouting the insulated wire on a jig board and encapsulating the wire with a quantity of light sensitive photopolymer material. After the windows are formed by washing away masked portions of the photopolymer material, the soldering connections are all made simultaneously.

3,753,047

TAMPER-PROOF ELECTRIC POWER DISTRIBUTION AND METER ENCLOSURE SYSTEM

Albert J. Shallbetter, 15 Kaiser Ave. N., Minneapolis, Minn.

Filed Aug. 20, 1971, Ser. No. 173,365
Int. Cl. H02b *9/00*
U.S. Cl. 317—107 **3 Claims**



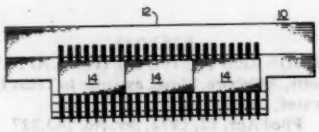
An electric power meter and distribution box suitable for use in mobile home parks and similar outdoor applications in which underground wiring is brought up through a vertical hollow stand pipe to which is affixed a base member by means of first and second pairs of set screws. The base member is adapted to support an enclosure in which is located one or more duplex receptacles, a set of circuit breakers, an electrical watt-hour meter, as well as any other similar type of power receptacles. The first pair of set screws is located external to the enclosure whereas the second pair of set screws is located within the enclosure. A hinged cover member, which may be locked, is provided to prevent unauthorized access or tampering with the electrical components.

3,753,048

MULTI-CHANNEL ELECTRICAL CONNECTOR

George Tuck, Leucadia, Everett R. Price, Escondido, and John E. Oakley, Encinitas, all of Calif., assignors to Teledyne, Inc., Los Angeles, Calif.

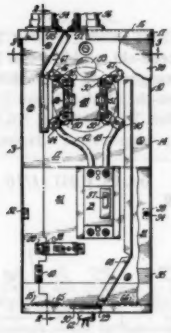
Continuation-in-part of Ser. No. 147,481, May 27, 1971, abandoned. This application Nov. 22, 1971, Ser. No. 201,062
Int. Cl. H02b *1/02*
U.S. Cl. 317—101 DH **8 Claims**



An electrical connector is disclosed which includes an insulative body having a first surface, a second surface and a third surface whose plane intersects the plane of the first and second surfaces. An interconnecting module is provided which includes an insulative support member and a plurality of resilient electrically conductive contact members. Each of these contact members includes a first end portion, a central portion and a second end portion. The central portion of each of the contact members is embedded in the support member such that each of the contact members is supported in spaced parallel relation relative to the other contact members. The support member is secured to the third surface of the insula-

tive body so that the first end portion of each of the contact members is positioned in one of a first plurality of grooves in the first surface and extends resiliently through the first surface and the second end portion of each of the contact members is positioned in a corresponding one of a second surface and extends resiliently through the second surface.

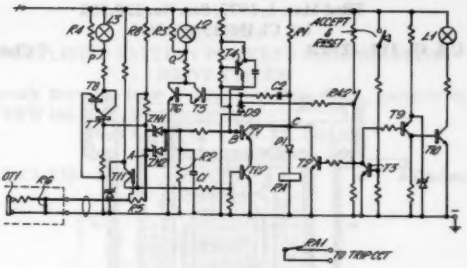
3,753,049
MULTIPLE CONNECTABLE POWER OUTLET BOX WITH CONDUIT SEPARATING BAFFLES
Merle A. Plummer, North Hollywood, Calif., assignor to Myers Electric Products, Inc., Los Angeles, Calif.
Filed Apr. 10, 1972, Ser. No. 231,256
Int. Cl. H02b
U.S. Cl. 317—107 **5 Claims**



An electric power outlet box is used to connect either an underground or overhead supply line led into the box, and by either underground or overhead outlet conduits from the box it services the establishment of an adjacent power consumer such as a unit in a mobile home park. Top and bottom walls of the upstanding, rectangular box are each formed with a pair of actual or potential apertures, members of each pair within the box being separated by a generally vertical channel-forming baffle, each baffle spaced laterally from the adjacent side-wall of the box and inwardly terminating at a central area adjacent terminals provided for connection of the inlet and outlet lines. A circuit breaker and jaws for mounting an electric meter are part of the circuit thus formed. Incoming and outgoing conduits placed along opposite sides of a baffle are thus physically isolated in event of sparking or flame-out in the box, and thus need not be carried through opposite walls to meet safety requirements. Such box may be mounted on the side of a hollow post, through which post an underground supply conduit can be brought into the box through a knock-out aperture in the rear face in place of use of one of the other four apertures. As many of the latter as are not used to carry conduits at a particular installation, remain sealed.

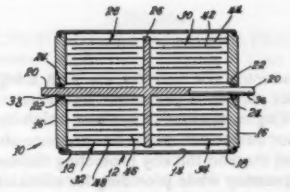
3,753,050
SEQUENTIAL SWITCHING DEVICE
Dennis Dawes Bowen, 8 Rowan Tree Dr., Sale, England
Filed Jan. 26, 1972, Ser. No. 221,011
Claims priority, application Great Britain, Jan. 27, 1971, 3,335/71; May 25, 1971, 16,787/71
Int. Cl. H01h *47/18, 47/22*
U.S. Cl. 317—141 S **8 Claims**

A sequential switching device for repeating an input signal such as one representing the opening of a circuit breaker at the far end of a cable, to a local switching means. The device includes a normally active on-off transistor oscillator which



stops oscillating in a non-conductive condition to warn of a cable fault, and in a conductive condition to repeat the input signal.

3,753,051
ELECTROLYTIC CAPACITOR HAVING LOW VALUE INDUCTANCE AND EQUIVALENT SERIES RESISTANCE
John Robert Willy, Easley, S.C., assignor to Sangamo Electric Company, Springfield, Ill.
Filed May 1, 1972, Ser. No. 249,394
Int. Cl. H01g *9/00*
U.S. Cl. 317—230 **10 Claims**



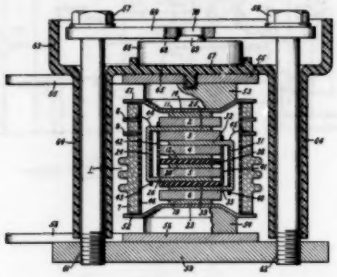
An electrolytic capacitor assembled in an elongated container in which a conductive arbor is axially disposed. The ends of the conductive arbor are electrically insulated from the end covers of the container and a conductive plate is secured crosswise to the conductive arbor to divide its interior into two chambers. Capacitor sections are wound around the arbor on either side of the conductive plate with the anode foil making parallel electrical contacts with the conductive plate and the cathode foil making parallel electrical contacts with the end covers.

3,753,052

RECTIFIER BRIDGE ASSEMBLY COMPRISING STACK OF HIGH-CURRENT PN SEMICONDUCTOR WAFERS IN A SEALED HOUSING WHOSE END CAPS COMPRISE AC TERMINALS OF THE BRIDGE

Daniel B. Rosser, Springfield, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Mar. 1, 1972, Ser. No. 230,586
Int. Cl. H01l 3/00, 5/00
U.S. Cl. 317—234 R 7 Claims



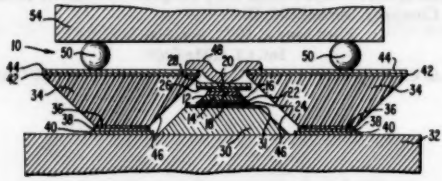
An integrally housed bridge circuit including a plurality of high power semiconductor rectifiers. The rectifiers are disposed within a hermetically sealed insulative housing and are electrically interconnected therein to form a bridge circuit having a pair of A-C terminals and a pair of D-C terminals.

3,753,053

SEMICONDUCTOR ASSEMBLY

George Allan Swartz, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 30, 1972, Ser. No. 302,291
Int. Cl. H01l 3/00; H01k 5/00
U.S. Cl. 317—234 R 16 Claims



A semiconductor assembly for use with a high frequency semiconductor device is presented which uses at least one stand-off having a conductive surface which overhangs the semiconductor device and which has pressure-absorbing contacts mounted thereon thereby protecting the semiconductor from direct pressure while providing for electrical contact to the semiconductor and allowing for very short leads from the stand-off to the semiconductor device.

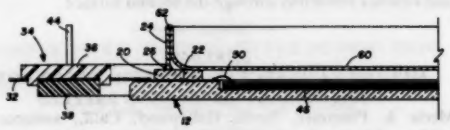
3,753,054

HERMETICALLY SEALED ELECTRONIC PACKAGE

Clair Allen Johnson, Sherman, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 67, Jan. 2, 1970, Pat. No. 3,657,805. This application Oct. 13, 1971, Ser. No. 188,445
Int. Cl. H01l 3/00, 5/00
U.S. Cl. 317—234 R 10 Claims

In a method of housing semiconductors, a sealing collar formed from a nickel-cobalt-iron alloy is mounted on a ceramic boat. An LSI slice is then mounted on the boat within the collar. Finally, a lid formed from the material of the collar is welded to the distal end of the collar. In a second embodiment of the method, the boat is formed from a ceramic ring, a



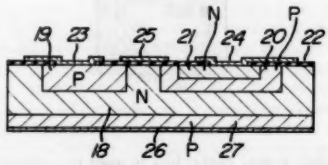
nickel-cobalt-iron alloy plate and a molybdenum plate. In a third embodiment, an LSI slice and at least one conventional integrated circuit are mounted on the boat within the collar.

3,753,055

FIELD EFFECT SEMICONDUCTOR DEVICE

Akio Yamashita, Ikeda-shi, and Takashi Fujita, Toyonaka-shi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma-shi, Osaka, Japan

Filed Dec. 28, 1971, Ser. No. 213,128
Claims priority, application Japan, Dec. 28, 1970, 45/124925
Int. Cl. H01l 11/10
U.S. Cl. 317—235 R 2 Claims



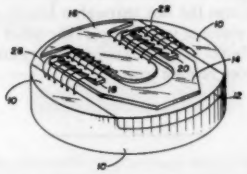
A field effect semiconductor switching device of high breakdown voltage and large current capacity having negative resistance characteristics which are controllable by an electric field.

3,753,056

MICROWAVE SEMICONDUCTOR DEVICE

Harry F. Cooke, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 787,928, Dec. 30, 1968, abandoned. This application Mar. 22, 1971, Ser. No. 126,885
Int. Cl. H01l 5/00
U.S. Cl. 317—234 R 4 Claims



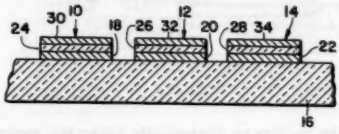
Semiconductor devices, such as transistors or diodes, which dissipate appreciable heat, may be mounted on an insert having high thermal conductivity in a discrete component configuration. This insert of high thermal conductivity, such as beryllia, is embedded in a disc of copper or other material having a high thermal conductivity and good electrical conductivity. The disc, with the insert embedded therein, may then be mounted in a microwave circuit formed on a dielectric substrate. Strip line jumpers are bonded to the microwave circuit

on the dielectric substrate and to the active elements of the semiconductor device formed on the insert. The disc is embedded in the substrate in a manner to be in electrical contact with a ground plane thereon so that the heat generated by the semiconductor device will be dissipated by the ground plane.

3,753,057
FRIT CAPACITOR

John W. Asher, Elmira, and Andrew Herczog, Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 729,800, May 16, 1968, Pat. No. 3,699,620. This application Sept. 14, 1970, Ser. No. 71,750
Int. Cl. H01g 3/06
U.S. Cl. 317—258 7 Claims

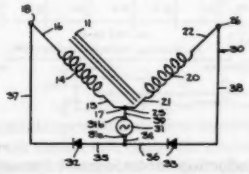


A frit capacitor of either the discrete or integrated microcircuit variety having a ferroelectric glass-ceramic dielectric whose dielectric constant is of intermediate value between about 20 and 400. The desired value of dielectric constant is accurately obtained in a readily reproducible manner by mixing a batch containing appropriate quantities of stable noncrystallizable glass partials and glass particles capable of forming a ferroelectric crystal phase. The desired dielectric constant is obtained by subjecting the batch to heat treatment. By controlling the weight ratio of the two glass components during the batch preparation, individual capacitor dielectrics having different dielectric constants can be provided utilizing the same firing schedule for each.

3,753,058
OPERATION OF MAGNETOSTRICTIVE APPARATUS

Alden P. Edson, Suffern, N.Y., assignor to The International Nickel Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 48,377, June 22, 1970, Pat. No. 3,634,742. This application Dec. 16, 1971, Ser. No. 208,822
Int. Cl. H01u 9/00
U.S. Cl. 318—118 11 Claims

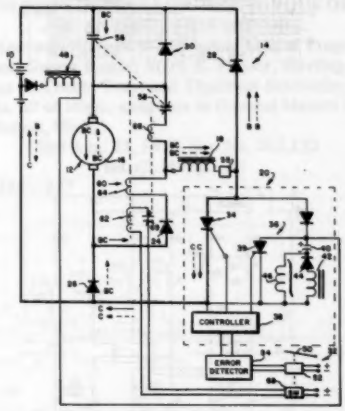


Electromechanical transducer core containing magnetostrictive material is energized by two mutually transverse electromagnetic fields controlled to oscillate the direction of magnetization cyclically and vibrate the core by longitudinal and transverse magnetostriction; electrically controlled change of resonant frequency is obtained with controlled variation of magnetization intensity.

3,753,059
SIMPLIFIED BATTERY POWERED REGENERATIVE DRIVE SYSTEM

Baruch Berman, Palos Verdes Peninsula, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Apr. 3, 1972, Ser. No. 240,389
Int. Cl. H02p 7/28
U.S. Cl. 318—139 6 Claims



A battery powered regenerative drive system having a time ratio controlled regenerative chopper circuit for regulating electrical power flow between the drive system battery and traction motor in both the drive and regenerative modes of the drive system, and a novel and simplified mode switching arrangement utilizing only two switches, which may be either unidirectional solid state switches or contacts of a single pole double throw relay, for switching the drive system between its drive and regenerative modes.

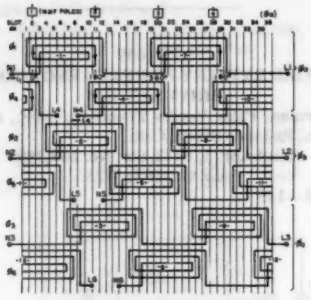
3,753,060
INDUCTION MOTOR SYSTEM FOR TRACTION

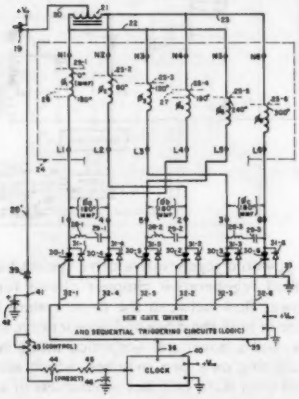
Jack E. Greenwell, Reno, Nev., assignor to Lear Motors Corporation, Reno, Nev.

Continuation of Ser. No. 144,897, May 19, 1971. This application June 5, 1972, Ser. No. 259,771
Int. Cl. H02p 5/40
U.S. Cl. 318—227 10 Claims

An electric induction motor/control system that provides the desirable high starting torque and torque-speed characteristic of series type direct current motors. The stator of the induction motor is polyphase with two specially interrelated winding sets per phase. The motor windings are supplied with unidirectional current pulses from silicon controlled rectifiers that are programmed to provide the traction mode of operation for the induction motor. The unique relation and interaction between the motor windings hereof and the associated electronic circuitry results in high power factor, good efficiency, and self-clearing SCR commutation action. The preferred motors use a squirrel cage rotor with no commutator, brushes, or slip rings. The complementary stator winding arrangements are not voltage limited, and thereby permit the construction of large power motor systems. Practical motor ratings are from fractional to over 500 horsepower, at speeds ranging from 600

to 40,000 rpm, and higher. The electronic control sections for even the high horsepower motors are operated at low voltage and with few watts. Control circuitry is provided that can





operate the motor system with traction output characteristics similar to that of series motors; and with direct speed reversal in such mode. The motor system requires little maintenance, and may be hermetically sealed.

3,753,061

CONTROL CIRCUIT FOR AC MOTOR

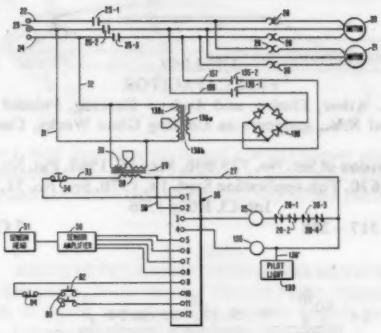
William A. Owens, Rossville, Ga., assignor to Electric Systems, Inc., Chattanooga, Tenn.

Filed Jan. 3, 1972, Ser. No. 215,057

Int. Cl. H02p *3/20*

U.S. Cl. 318—212 **3 Claims**

A control circuit is employed to stop a tufting machine with its needles up and clear of the carpet. The AC motors, which drive the needle bar through a drive shaft connected to the motors, are disconnected from the power source when the drive shaft of the tufting machine is at a preset or selected position. After this position of the drive shaft is determined, the circuit has means to count a selected number of revolutions of the drive shaft and to then cause a DC voltage to be



applied to the motors to dynamically brake the motor. As a result, the needles are positioned up and clear of the carpet when the motors are stopped.

3,753,062

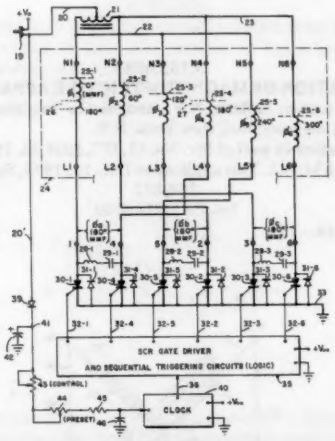
POLYPHASE MOTOR SYSTEM WITH DC MOTOR CHARACTERISTICS

Jack E. Greenwell, Reno, Nev., assignor to Lear Motors Corporation, Reno, Nev.

Filed May 19, 1971, Ser. No. 144,897

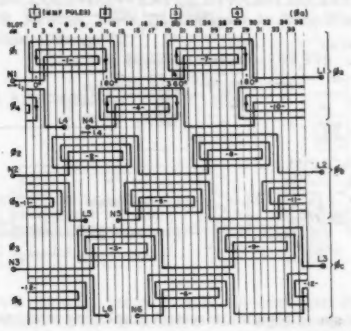
Int. Cl. H02p *7/36*; H02k *17/02*

U.S. Cl. 318—225 R **13 Claims**



An electric induction motor/control system that provides the desirable high starting torque and wide speed characteristics of direct current motors. The stator of the induction motor has two specially interrelated winding sets per phase. The motor windings are supplied with unidirectional current pulses from silicon controlled rectifiers that are programmed

to provide advantageous modes of operation for the motor. The unique relation and interaction between the motor windings hereof and the associated electronic circuitry results in high power factor, good efficiency, and self-clearing SCR commutation action. The preferred motors use a squirrel cage rotor with no commutator, brushes, or slip rings. The complementary stator winding arrangements are not voltage limited, and thereby permit the construction of large power motor systems. Practical motor ratings are from fractional to over



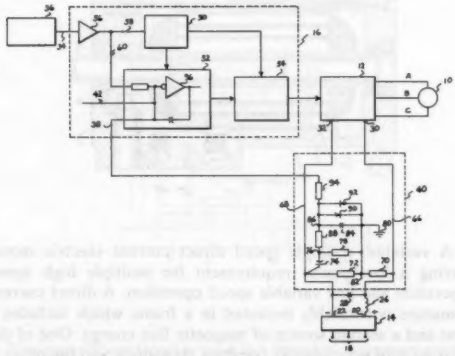
500 horsepower, at speeds ranging from 600 to 40,000 rpm, and higher. The electronic control sections for even the high horsepower motors are operated at low voltage and with few watts. Control circuitry is provided that can operate the motor systems: (a) at constant output torque over a wide speed range; (b) at constant horsepower over a selected speed range; (c) with traction output characteristics similar to that of series motors; (d) at constant speed; (e) and with direct speed reversal in any of these modes. These motor systems require little maintenance, and may be hermetically sealed.

3,753,063

STABILIZING MEANS FOR AN A-C MOTOR DRIVE

Carlton Eugene Graf, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed June 13, 1972, Ser. No. 262,270
Int. Cl. H02p *5/16*
U.S. Cl. 318—227 **6 Claims**



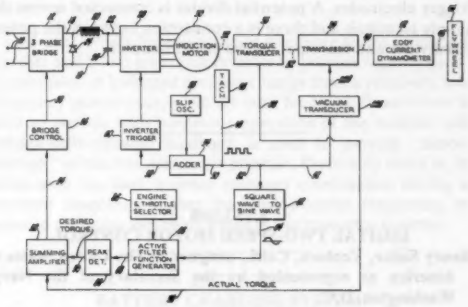
An a-c adjustable speed motor drive system including an a-c motor and power conversion means for converting d-c electric power to adjustable frequency, adjustable voltage electric power for delivery to the motor is provided with stabilizing means for damping motor speed oscillations. The stabilizing means includes apparatus for generating a first signal having oscillations therein related to oscillations in the d-c voltage of the electric power supplied to the power conversion means and means responsive to the first signal for generating a stabilizing signal phase shifted with respect to the first signal. The stabilizing signal is supplied to and utilized by the control apparatus for the power conversion means as a control signal to adjust the power output, preferably the output voltage, of the power conversion means. The stabilizing signal generator means includes a phase shifting network for phase shifting the stabilizing signal relative to the first signal by an amount sufficient to cause oscillations in the output voltage to occur substantially in-phase with oscillations in the motor speed.

3,753,064

SYSTEM FOR CONTROLLING THE TORQUE OUTPUT OF AN INDUCTION MOTOR

Paul D. Agarwal; Richard W. Johnston, both of Troy; John G. Neuman, Grosse Pointe; Mark E. Preiser, Sterling Heights; Norman L. Traub, Troy, and Thaddeus Schroeder, Sterling Heights, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 21, 1972, Ser. No. 282,132
Int. Cl. H02p *5/40*
U.S. Cl. 318—227 **5 Claims**



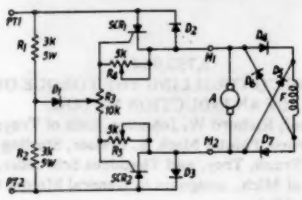
A motor control system for an induction motor which is capable of controlling the induction motor such that it operates with a predetermined torque-speed characteristic. The induction motor is operated with a predetermined constant slip frequency and the input voltage to the induction motor is varied to control the output torque and speed of the induction motor. The control system includes a closed loop feedback arrangement for controlling the output torque and speed of the induction motor such that the motor simulates the torque-speed characteristic of an internal combustion engine. Since the induction motor can be controlled to simulate the torque-speed characteristic of an internal combustion engine it can be used as a power source for driving an automatic transmission in a test setup for testing automatic transmissions. The control system includes means for sensing the actual output speed of the induction motor and the actual output torque of the induction motor. An electrical signal which is a function of induction motor output speed is applied to a function generator and the output of this function generator determines the desired output torque of the induction motor. The function generator is an active low pass filter and is designed to simulate various internal combustion engine torque-speed characteristics for various throttle settings for a given internal combustion engine.

3,753,065

METHOD OF REGULATING AND CONTROLLING SPEED AND DIRECTION OF ELECTRIC MOTORS AND APPLIANCE

Seaborn Howard Chiles, San Francisco, Calif., assignor to Chiles (Patents and Systems) Limited, Hong Kong, Hong Kong

Filed Oct. 29, 1971, Ser. No. 193,912
Int. Cl. H02p 5/16
U.S. Cl. 318—257 10 Claims



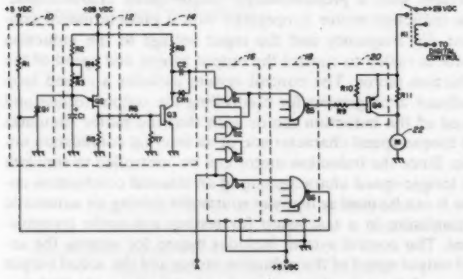
A control circuit for a reversible electric motor to be driven from an a.c. supply. Two thyristors are connected on respective sides of the motor in a series circuit including the thyristors, the motor and the a.c. terminals. The thyristors are inversely connected with respect to each other and a potentiometer is connected with respective ends to the thyristor trigger electrodes. A potential divider is connected across the supply terminals and there is a connection between the potential divider and the wiper on the potentiometer.

3,753,066

DIGITAL TWO-SPEED MOTOR CONTROL

Henry Sailer, Ventura, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 8, 1972, Ser. No. 251,063
Int. Cl. H02p 5/16
U.S. Cl. 318—305 10 Claims



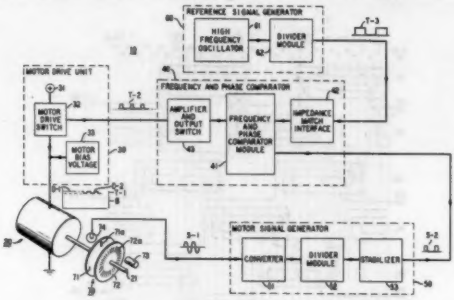
A remote digital two-speed motor control, for controlling frequency or bandwidth tuning of a jamming transmitter. A digitally controlled transistor switches the speed of a motor after a predetermined time delay. The motor may be retained in the initial speed by continuous resetting of the digital circuit before the timing circuit reaches a firing voltage.

3,753,067

MOTOR SPEED REGULATION SYSTEM

Lee J. Milligan, Fairfield, N.J., assignor to Peripheral Systems Corp., Fairfield, N.J.

Filed May 17, 1972, Ser. No. 254,242
Int. Cl. H02p 5/16
U.S. Cl. 318—314 12 Claims



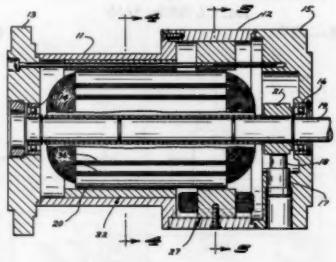
A motor speed regulation system employing integrated and discrete semiconductor components, in which either a direct drive signal or a digitally incremented biasing signal is applied to the motor to bring it up to speed or to maintain it at a desired speed under load.

3,753,068

CONTROLLED SPEED ELECTRIC MOTOR

Peter Walker, Jr., Brooklyn, Minn., assignor to Electro-Craft Corporation, Hopkins, Minn.

Filed Nov. 9, 1971, Ser. No. 197,055
Int. Cl. H02p 5/06
U.S. Cl. 318—338 12 Claims



A variable, multiple speed direct current electric motor having a low power requirement for multiple high speed operation and low variable speed operation. A direct current armature is rotatably mounted in a frame which includes a first and a second source of magnetic flux energy. One of the sources is of substantially constant magnitude and the other is adjustably variable. The sources of magnetic flux energy are axially spaced apart so that the magnetic field from each of them may be linked to different portions of the armature and its conductors along any given axial length thereof.

In various modes of operation the effect of the variable source of magnetic flux may be used in an additive or subtractive sense, with respect to the axially extending conductors or the armature to provide a multiple high speed operation having low driving voltage requirements for the armature supply,

or in a variable low speed operation to materially reduce the driving current requirements for the armature supply.

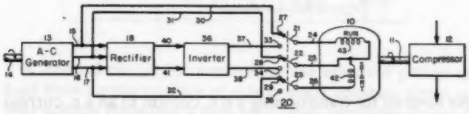
The overall result is a motor providing improved performance characteristics over a wide range of speed of operation while reducing the power requirements and the complexity of the power supplies and controllers.

3,753,069

START-UP SYSTEM FOR INVERTER DRIVEN MOTOR INCLUDING INVERTER BYPASS CIRCUITRY

Alwin B. Newton, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 18, 1971, Ser. No. 199,875
Int. Cl. H02p 1/16
U.S. Cl. 318—440 **5 Claims**



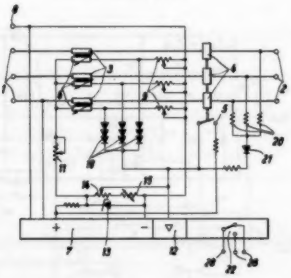
An AC electrical motor is normally energized from an inverter which in turn is coupled to a rectifier. An alternator driven from a variable speed source supplies energy to the rectifier. During start-up non-regulated output energy of the alternator is passed directly to the motor until the system approaches operating speed. After start-up, the motor is energized from the inverter at the appropriate normal operating voltage and frequency. The system may be used in a car, where an alternator energizes the motor driving a compressor in the air conditioning system.

3,753,070

PROTECTIVE CIRCUIT FOR ELECTRIC MOTORS

Franz Bunger, Mannheim, and Karl-Heinz Lehmann, Oftersheim, both of Germany, assignors to Brown, Boveri & Cie Aktiengesellschaft, Mannheim, Germany

Filed Dec. 6, 1971, Ser. No. 205,246
Claims priority, application Germany, Dec. 9, 1970, P 20 60 483.5
Int. Cl. H02h 7/085
U.S. Cl. 318—472 **10 Claims**



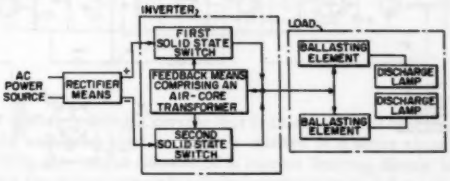
The protective circuit is used in a switching arrangement for protecting an electric motor against thermal overload, and of the type including a heating resistor in the motor supply circuit, a temperature sensing resistor, having a highly temperature-dependent resistance characteristic, in heat transfer contact with the heating resistor and a motor cut-off control means connected to the temperature sensitive resistor to provide a signal voltage for disconnecting the motor from its source of potential upon thermal overloading of the motor. The heating resistor has a thermal behavior simulating the thermal behavior of the motor to be protected. A bias voltage is applied to the input of an amplifier of the cut-off control means, and this bias voltage can be set on a potentiometer and is influenced by an additional temperature-dependent resistor to compensate the room temperature at the location of the switching arrangement. The arrangement may be used with either a direct current motor supply, a single phase AC motor supply, or a polyphase AC motor supply.

3,753,071

LOW COST TRANSISTORIZED INVERTER

Joseph C. Engel, Monroeville, and Robert T. Elms, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 15, 1972, Ser. No. 263,041
Int. Cl. H02m 5/44
U.S. Cl. 321—2 **9 Claims**



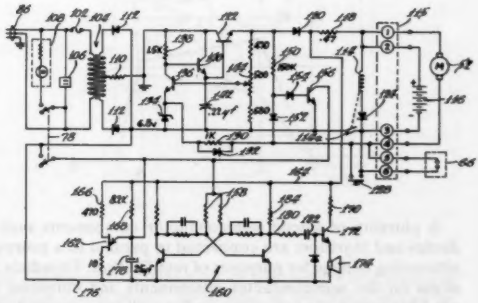
Low cost circuit for operation of discharge lamps utilizing a rectifier and a two-transistor inverter to provide high-frequency operation of ballasted discharge lamps from a relatively low frequency power source. An air-core feedback transformer is used to provide high frequency operation of the inverter and voltage-shift-initiated feedback is used to prevent "shoot-through" of the two-transistor inverter. Preferably there is, in series with the load, a series resonant combination having a resonant frequency higher than the inverter frequency, in order to minimize switching losses in the transistor inverter.

3,753,072

BATTERY CHARGING SYSTEM

Francis T. Jurgens, Chicago, Ill., assignor to Anthony Peters, Wood Dale, Ill.

Filed Nov. 30, 1971, Ser. No. 203,161
Int. Cl. H02j 7/10, 9/00
U.S. Cl. 320—39 **2 Claims**



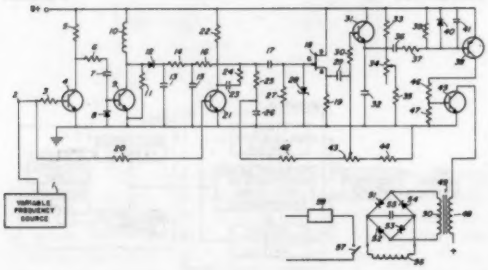
A battery charging circuit for an auxiliary battery in a sump system having voltage sensing means for cutoff utilizing a line

transistor which is controlled by a charging capacitor. The circuit also includes polarity protection means.

ERRATUM

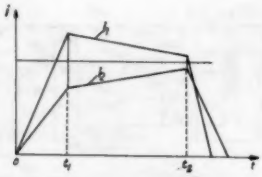
For Class 321—2 see:
Patent No. 3,753,071

3,753,073
SIGNAL INTERPRETING CIRCUIT
Wendell G. Rawlins, 913 Croix St., Topeka, Kans.
Filed Jan. 20, 1972, Ser. No. 219,399
Int. Cl. H02m 7/00
U.S. Cl. 321—6 **12 Claims**



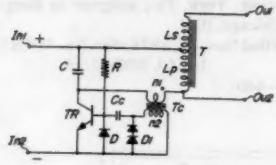
A signal interpreting circuit for switching an output load in response to an increasing input frequency, the circuit having a frequency to direct current converter for providing a direct current voltage varying inversely with input frequency, a load controlling circuit for continuously energizing the load as long as the direct current voltage remains the same or increases, and a capacitor-transistor circuit responsive to a decreasing of the direct current voltage for interrupting the continuously energized load.

3,753,074
PARALLEL CONNECTION OF SURGE VOLTAGE-RESISTANT SEMICONDUCTOR ELEMENTS SUCH AS DIODES THYRISTORS HAVING DIFFERING AVALANCHE VOLTAGE
Han Jurg Bossi, Nussbaumen, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland
Filed Feb. 10, 1969, Ser. No. 797,992
Int. Cl. H02m 1/18
U.S. Cl. 321—11 **1 Claim**



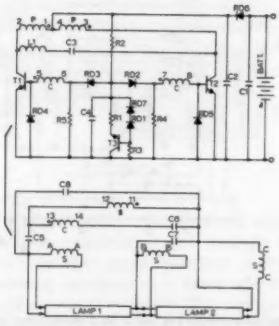
A plurality of silicon semiconductor components such as diodes and thyristors are connected in parallel to a source of alternating voltage for purposes of rectification. To reduce the stress on the semiconductor components and eliminate the need for wiring capacitors in parallel with the semiconductor components, the component which exhibits the highest avalanche voltage characteristic is placed in the circuit where passage of current in the forward direction through the semiconductor components has its lowest value.

3,753,075
INVERTER
Teruichi Tomura, and Hiroyuki Iyama, both of Kunitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed July 3, 1972, Ser. No. 268,444
Claims priority, application Japan, July 6, 1971, 46/49712
Int. Cl. H02m ; H03b
U.S. Cl. 321—44 **21 Claims**



An inverter for transforming a d.c. current to an a.c. current comprising, a switching transistor and an output transformer having a primary winding connected to the collector of the transistor, a current transformer having a primary winding connected to the primary winding of the output transformer and a secondary winding connected to the base of the switching transistor, a coupling capacitor inserted between said base of the transistor and the secondary winding of the current transformer, a capacitor parallelly connected to the primary winding of the output transformer, the primary windings of the output and current transformers and said capacitor forming a resonance circuit to control the oscillation.

3,753,076
INVERTER CIRCUIT AND SWITCHING MEANS
William B. Zelina, Edinboro, Pa., assignor to Lighting Systems, Inc., Erie, Pa.
Filed Apr. 27, 1972, Ser. No. 248,035
Int. Cl. H02m 7/52
U.S. Cl. 321—45 R **23 Claims**



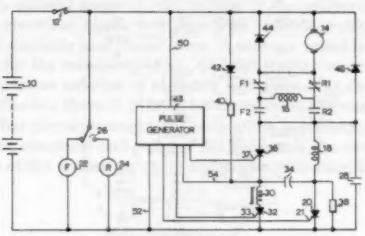
An inverter suitable for use as a fluorescent light ballast is disclosed. The inverter has a constant output regardless of load. Good efficiency at high frequency is provided by minimizing the transistor switching losses by means of a resonant storage means and a unique feedback and magnetic structure.

3,753,077

DIRECT CURRENT CHOPPER CONTROL CIRCUIT

Albert W. Anderson, and Charles E. Konrad, both of Roanoke, Va., assignors to General Electric Company, Salem, Va.

Filed Aug. 31, 1971, Ser. No. 176,569
Int. Cl. H02m 3/32
U.S. Cl. 321—45 C 4 Claims



A control circuit for controlling the effective power to a load from a power source of substantially constant direct current voltage including a first solid state switching device for placing the load and the power source in series. Circuitry including a commutating capacitor chargeable in a first direction, provides that capacitor discharge, initiated by the gating of a second solid state switching device, will terminate conduction of the first switching device. An inductance is provided in series with the load to develop a capacitor voltage in a second direction, related to load current, upon the termination of the conduction period. A series loop is provided including the capacitor, the inductor, and a third solid state switching device to reverse the polarity of the capacitor voltage to the first direction.

ERRATUM

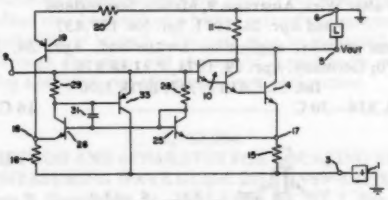
For Class 322—28 see:
Patent No. 3,753,080

3,753,078

FOLDBACK CURRENT CONTROL CIRCUIT

Kurt K. Hedel, Utica, N.Y., assignor to General Electric Company, Utica, N.Y.

Filed May 3, 1972, Ser. No. 250,005
Int. Cl. G05f 1/10
U.S. Cl. 323—9 5 Claims



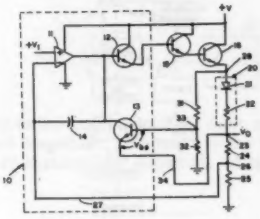
In a foldback current control circuit, a sensing resistor is connected in series between a source and an output transistor. The sensing resistor biases the emitter of a first transistor of a matched pair included in a comparison circuit. The emitter of the second transistor of the pair is biased by a reference resistor which provides a reference voltage in response to load voltage. When a fault in the load circuit of the output transistor occurs, the reference voltage exceeds a threshold, and the potential at the collector of the second transistor exceeds that of the first in order to turn on a third transistor. The third transistor shunts base drive from the output transistor to prevent damage to the output transistor and load. Self-compensation of the circuit for temperature is achieved through use of the matched transistors in the comparison circuit and by maintaining nearly equal collector currents in the matched pair during an overload condition.

3,753,079

FOLDBACK CURRENT LIMITER

Ted R. Trilling, Berkshire Rd., R.D. 3, Doylestown, Pa.

Filed Mar. 8, 1972, Ser. No. 232,791
Int. Cl. G05f 1/58
U.S. Cl. 323—4 8 Claims



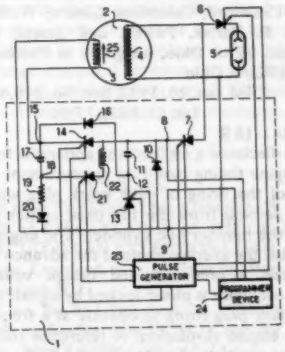
A diode providing a current that is an exponential function of the voltage applied across it is inserted in a series circuit carrying the output current of a current limiting device in which the voltage across the diode is reduced upon a short circuit taking place at an output terminal. This reduction in voltage severely limits the current through the diode at an exponential rate thereby affecting a sharp reduction in the short circuit current.

3,753,080

ELECTRIC CONTROL DEVICE FOR AN ALTERNATOR

Andre Jules, Sartrouville, France, assignor to Compagnie Generale D'Electricite, Paris, France

Filed Oct. 17, 1972, Ser. No. 298,221
Claims priority, application France, Oct. 18, 1971, 7137339
Int. Cl. A02p 11/06
U.S. Cl. 322—28 2 Claims



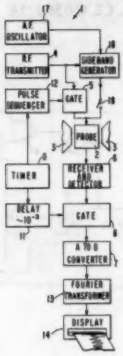
An electric control device for an alternator which produces short high power pulses, comprising an electronic circuit including a capacitor, thyristors and rectifiers, the energizing power of the alternator being stored in the capacitor at the end of each pulse, the power stored in that capacitor being discharged in the energizing winding to effect the priming of the alternator for a succeeding pulse.

3,753,081

GYROMAGNETIC RESONANCE METHOD AND APPARATUS FOR OBTAINING SPIN-SPIN COUPLING CONSTANTS

Raymond Freeman, Menlo Park, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Dec. 30, 1971, Ser. No. 214,137
Int. Cl. G01n 27/78
U.S. Cl. 324—0.5 R 12 Claims



Spin-spin coupling constants are obtained by exciting and detecting a decaying train of time displaced spin echo resonances of a plurality of spin-spin coupled groups of gyromagnetic resonators, such as a group of chemically shifted homonuclear atomic nuclei, within a sample under analysis. The envelope of the peak amplitude of the train of spin echo resonances decays and is modulated in accordance with the spin-spin coupling constants. The modulated envelope is Fourier analyzed to separate the individual Fourier frequency components, each component corresponding to one-half the sums and differences of the different spin-spin coupling constants, whereby a spectrum of spin-spin coupling constants is obtained which is free of magnetic field inhomogeneity effects and chemical shifts.

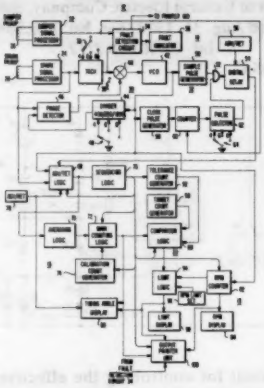
3,753,082

AVERAGE TIMING METHOD AND APPARATUS FOR INTERNAL COMBUSTION ENGINES

Arthur R. Crawford, Columbus; Glenroy W. Barnett, Dublin; Richard E. Porter, Powell, and Joseph R. Pottebaum, Columbus, all of Ohio, assignors to Production Measurements, Hilliard, Ohio

Filed Jan. 20, 1972, Ser. No. 219,416
Int. Cl. F02p 17/00
U.S. Cl. 324—16 R 42 Claims

There is disclosed a method and apparatus for internal combustion engine timing based on measurement of the advance or retard of the firing of each spark plug with respect to a reference derived from the top dead center position of the piston for the number one cylinder. The engine timing is adjusted so that the average value of the advance or retard for all plugs equals a predetermined design value. A variable frequency oscillator is phase-locked by signals representing individual spark plug firing to operate at a frequency of 3,600 pulses per engine revolution. A reference related to the top dead center position of piston for the first cylinder is determined by sensing a notch in the engine damper or fan pulley, and is used to produce a series of pseudo damper pulses offset from the top dead center positions of the various pistons by 45 degrees by dividing the output of the variable frequency oscillator and selecting pulses to define the pseudo damper pulse interval based on the number of cylinders in the engine being timed. Timing measurement is achieved by counting the number of pulses between firing of a plug and the associated pseudo damper pulse over several complete engine operating cycles, averaging the result and removing the 45° offset.



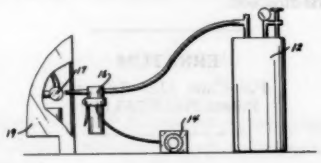
Digital display, printout, upper and lower limit computation and actual engine RPM measurements are also provided.

3,753,083

SWITCH TESTING APPARATUS

Donald L. Hardesty, 900 Olmstead Ave., Evansville, Ind.

Filed July 6, 1971, Ser. No. 159,931
Int. Cl. G01r 31/02
U.S. Cl. 324—28 2 Claims



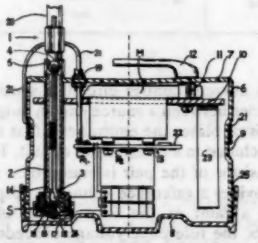
A method for testing a thermal-responsive switch which utilizes liquidized nitrogen for lowering the switch to its operational level.

3,753,084

APPARATUS FOR THE RAPID ELECTROMETRIC DETERMINATION OF ION ACTIVITY

Wily Walter Wirz, Austrasse 9, Meilen, Switzerland

Filed Apr. 26, 1971, Ser. No. 137,437
Claims priority, application Switzerland, Apr. 24, 1970, 6235/70; Germany, Apr. 19, 1971, P 21 18 876.1
Int. Cl. G01n 27/42; B01k 3/00
U.S. Cl. 324—30 C 16 Claims



An apparatus for the rapid electrometric determination of ionic activities, especially the pH-value, p(Me)-value or p(L)-

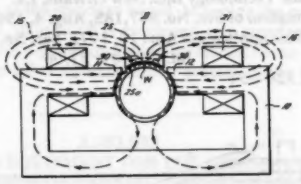
value of substances, by means of an ion sensitive or ion specific sensor of low or extremely high internal resistance. There is also provided a preferably transistorized amplifier circuit arrangement and an indicator device for the indication of the measurement values in analogue or digital form. According to the invention there is provided as the sensor an electrode measuring chain possessing measuring- and reference electrode means, such electrode-measuring chain exhibiting a clearly defined point of intersection of the isotherms, a constant electrical chain null point, an internal buffer of high buffer capacity and stable slope. A storage vessel is also provided for the measuring chain, and this storage vessel contains an activation solution to maintain said measuring chain under the influence thereof. Fixedly balanced resistor means for said amplifier circuit arrangement control the asymmetrical potential, the electrical null point of the apparatus, the temperature factor of the measuring chain and the amplification factor.

3,753,085

NON-DESTRUCTIVE TESTING APPARATUS FOR DETECTING BOTH TRANSVERSE AND LONGITUDINAL WELD DEFECTS WITH A SINGLE INSPECTION

Arthur W. Morton, and Donald Lloyd, both of Houston, Tex., assignors to Tex-Tube Division of Detroit Steel Corporation, Houston, Tex.

Filed Mar. 13, 1972, Ser. No. 234,295
Int. Cl. G01r *33/12*
U.S. Cl. 324—37 **8 Claims**



Non-destructive testing apparatus for locating anomalies or defects in either a longitudinal or circle weld in a pipe, wherein the signal-to-noise ratio is increased by the use of bidirectional magnetization at the area of inspection and by the spacing of the anomaly detector probe off the pipe a predetermined distance, whereby discontinuities or weld anomalies at any point through the weld from the outside diameter to the inside diameter can be detected, and by a predetermined positioning of the coils of the probe, the weld anomalies may be detected whether extending predominantly longitudinally or laterally. The pipe may be inspected as it is run through the pipe mill during its manufacture, without utilizing a separate run of the pipe for the inspection.

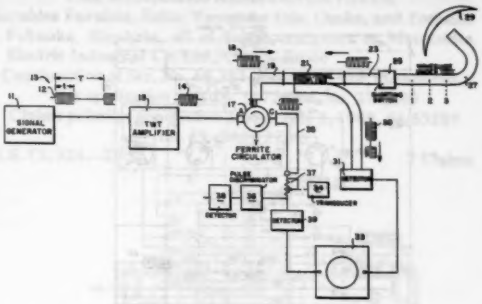
3,753,086

METHOD AND APPARATUS FOR LOCATING AND MEASURING WAVE GUIDE DISCONTINUITIES

William B. Shoemaker, Jr., 1995 Valley Rd., Rt. 1, Box 361 K, Annapolis, Md.

Filed Dec. 9, 1970, Ser. No. 96,512
Int. Cl. G01r *31/11, 27/04*
U.S. Cl. 324—52 **15 Claims**

An intermittent pulsed carrier signal having a frequency of approximately 10 gigahertz and on for approximately 10 nanoseconds duration is transmitted through a wave guide. Wave guide discontinuities reflect a portion of the incident pulse, and these reflected signals are detected and compared to the incident pulse relative to time and amplitude differences. The discontinuity point in the wave guide is then directly determined using time domain reflectometry, from the time interval for the signal to reach the discontinuity and for the reflected wave totravel back along the wave guide and be detected. As the intensity of the reflected signal is functionally related to the magnitude of the fault, a display of the reflected signal magnitude, compared to the incident signal magnitude, will indicate the magnitude of the wave guide discontinuity.

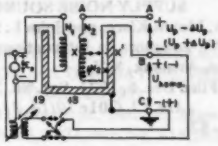


3,753,087

METHOD FOR TESTING AND LOCATING FAULTS IN INSULATION OF AN ELECTRICAL APPARATUS AND UTILIZATION OF THE METHOD

Tjhing Thian Tan, Baden, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed June 1, 1971, Ser. No. 148,535
Claims priority, application Switzerland, June 4, 1970, 8364/70
Int. Cl. G01r *31/10, 31/12*
U.S. Cl. 324—52 **12 Claims**



A method of testing insulation and pinpointing faults in a winding of electrical apparatus wherein by adjusting a test voltage, a change in the potential difference between the winding and an electrically conductive part is brought about. The purpose of this is to effect a striking and extinction of an electrical discharge at a point between the winding and electrical conductive part which exhibits a weak insulating characteristic which is detected by means of a discharge-indicating device.

3,753,088

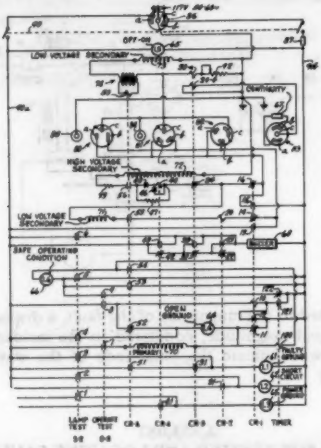
DEVICE FOR TESTING THE ADEQUACY OF ELECTRICAL CIRCUIT SUCH AS THE GROUND CIRCUIT OF AN EXTENSION CORD

David J. Ettelman, Cranford, N.J., assignor to Multi-Amp Corporation, Cranford, N.J.

Division of Ser. No. 857,796, Sept. 15, 1969, Pat. No. 3,643,157. This application July 19, 1971, Ser. No. 164,072
Int. Cl. G01r *31/02, 15/12*
U.S. Cl. 324—51 **4 Claims**

Device for testing the adequacy of the ground and power circuits of electric tools, extension cord and the like by performing an automated series of individual tests in sequence. The major tests are to determine: open ground circuit, faulty ground circuit, short circuit and poor insulation. If no faults are found by these tests, the circuit under test is next connected to line potential to determine if it operates properly.

During this phase of testing, the potentials and currents associated with the previous tests are discontinued to avoid power drain and heating. A saturating current transformer protects an essential relay from damage from excessive current. A long extension cord having a proper ground resistance (in the order of the resistance exhibited by a tool having a faulty ground cord) may be tested by modifying the test currents so that an erroneous faulty ground indication is not given.

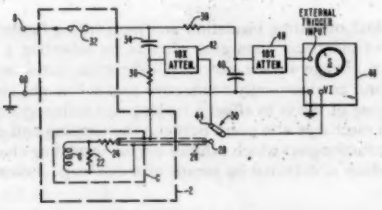


3,753,089

ELECTRONIC SWITCHING TRANSIENT DETECTOR AND METHOD FOR LOCATING ELECTRICAL POWER SUPPLY NOISE SOURCES

John B. Gunn, Mount Kisco, and John L. Staples, Pleasantville, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 6, 1971, Ser. No. 204,881
Int. Cl. G01r *19/14, 31/08*
U.S. Cl. 324—52 **4 Claims**



A procedure is described for locating the source of electrical noise generated in any branch of an electrical power distribution network. A noise probe, consisting of a small coil mounted in an insulated housing which is held near a power supply line to inductively couple to the magnetic field of the noise current present in that line, is employed to find the source of electrical noise.

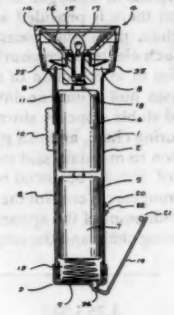
3,753,090

COMBINATION FLASHLIGHT AND CONTINUITY TESTER HAVING HINGED CONTACT

Harry P. Tomek, 4524 Tennessee, St. Louis, Mo.

Filed Mar. 7, 1972, Ser. No. 232,486
Int. Cl. G01r *31/02*
U.S. Cl. 324—53 **1 Claim**

A common flashlight is adapted to either a normal portable lighting function or to use as a continuity tester. Two electrical conductors, used externally, serve as continuity test probes. One of these conductors is electrically connected through the flashlight bulb to one side of the battery supply. The second conductor is electrically connected to a second side of the battery supply. Continuity is checked by touching the probes to the circuit to be tested. The bulb glows when the circuit is continuous.

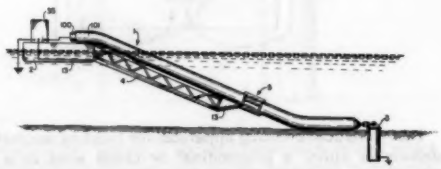


3,753,091

METHOD AND DEVICE FOR DETECTING FAULTS IN NON-CONDUCTIVE COATINGS ON UNDER WATER PIPELINES

Walter J. Daspit, New Orleans, La., assignor to Submarine Pipeline Technology Inc., New Orleans, La.

Continuation of Ser. No. 847,185, Aug. 4, 1969, abandoned.
This application Apr. 10, 1972, Ser. No. 242,870
Int. Cl. G01r *31/00*
U.S. Cl. 324—54 **14 Claims**



The method of and apparatus for detecting faults in non-conductive coatings on underwater pipelines as the pipes are being laid by lay barges unto the ocean bottom or after the pipes have been laid on the bottom. The detector of the apparatus comprises in lay barge and jet barge embodiments three electromagnetic pickup coils placed near the pipe surface which detect a change in an electromagnetic field produced by a fault in the non-conducting coating as a low voltage is applied across the pipe. A Wheatstone bridge hookup is provided to maximize the effects of the system. One of the three coils is used as the primary sensing coil while the other two are used to indicate when the electromagnetic field is being unbalanced by the presence of nearby metal objects rather than by a fault in the coating. A simplified hand-held model having one coil is likewise disclosed.

3,753,092

LIQUID TESTING DEVICE FOR MEASURING CHANGES IN DIELECTRIC PROPERTIES

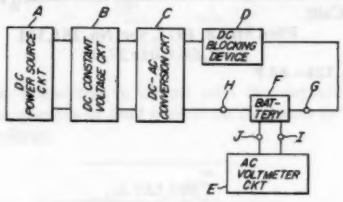
Thomas B. Ludlow, St. Paul, and Keith S. Champlin, Minneapolis, both of Minn., assignors to Johanna Plastics, Inc., St. Paul, Minn.

Filed Apr. 8, 1971, Ser. No. 132,299
Int. Cl. G01r *27/26*
U.S. Cl. 324—61 R **16 Claims**

A self-contained apparatus for measuring small changes in the permittivity or dielectric constant of an insulating liquid

such as, e.g., lubricating oil. A few drops of said liquid are placed in an open-type test cell possessing two coplanar electrodes imbedded in a low permittivity, insulating material forming its bottom surface. The electrode configuration is designed such that the electrical capacitance between electrodes is strongly dependent upon the permittivity of the liquid but is virtually independent of the quantity of liquid in the test cell.

The electrodes are connected to a comparison circuit which is designed to be optimally sensitive to small changes in electrical capacitance. The comparison circuit contains a variable



capacitor for balancing the capacitance of the test cell and a null meter for detecting this balance condition. The dial scale attached to the variable capacitor is initially set to zero by balancing the instrument with a standard liquid in the test cell. Measurements on sample liquids thereafter yield readings proportional to the deviation of the permittivity of the sample liquid from that of the standard liquid. In testing the quality of a lubricating oil, unused oil is employed as a standard liquid and the permittivity deviation is directly related to the amount of oxidation and other contamination present in the oil sample.

3,753,093

METHOD AND EQUIPMENT FOR THE DETERMINATION OF THE DEGREE OF ABRASIVENESS OF MAGNETIC TAPE

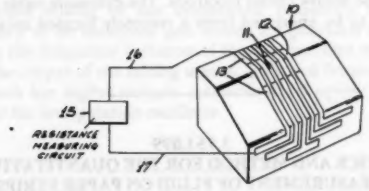
Leslie William Gardner, Cippenham, Slough; Nicholas James Helbren, Cowley, Oxbridge; Duncan Stewart, Slough, and Gwilym Iorwerth Williams, Farnham Royal, Slough, all of England, assignors to Fulmer Research Institute Limited, Buckinghamshire, England

Filed Dec. 29, 1971, Ser. No. 213,594

Claims priority, application Great Britain, Jan. 15, 1971, 2,080/71

Int. Cl. G01r 27/02

U.S. Cl. 324—65 R **10 Claims**



A method is described for the determination of the degree of abrasiveness of magnetic tape which method comprises passing the magnetic tape over the working surface of a simulated recording head fabricated of an electrically non-conducting material and geometrically closely approximating the dimensions of an actual recording head, the working surface of the simulated head having deposited thereon one or more thin strips of a magnetic alloy similar to the magnetic alloy used for the actual head, and observing the increase in electrical resistance of the magnetic alloy strip or strips. A device suitable for use in the method is also disclosed.

3,753,094

OHMMETER FOR MEASURING THE INTERNAL RESISTANCE OF A BATTERY AND DIRECTLY READING THE MEASURED RESISTANCE VALUE

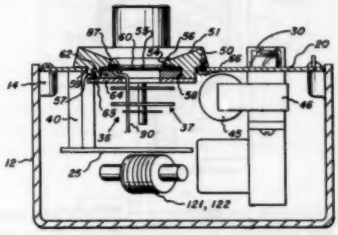
Haruhisa Furuishi, Suita; Yasunobu Iida, Osaka, and Toshiaki Fukuoka, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Continuation of Ser. No. 48,381, June 22, 1970, abandoned. This application July 24, 1972, Ser. No. 274,809

Claims priority, application Japan, July 1, 1969, 44/53589

Int. Cl. G01n 27/46

U.S. Cl. 324—29.5 **7 Claims**



An ohmmeter for measuring the internal resistance of a battery by an A.C. method. The output of a DC power circuit is converted into an alternating current of prescribed frequency through a DC - AC conversion circuit. The alternating current flows through a battery by way of a DC blocking device and the voltage drop due to the internal resistance of the battery is introduced into an AC voltmeter circuit. The internal resistance of the battery is indicated at the indicating portion of the AC voltmeter circuit so that it is read directly.

3,753,095

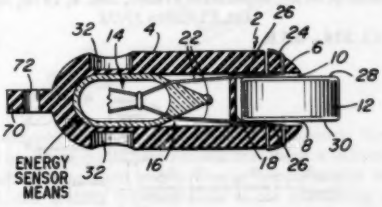
BATTERY TESTER HAVING A PLIABLE RESILIENT BODY MEMBER FOR ACCOMODATING THE BATTERY TO BE TESTED

Nathan P. Nichols, 121 Nichols St., Danvers, Mass.

Filed Feb. 16, 1971, Ser. No. 115,261

Int. Cl. H01m 31/04; G01r 31/00

U.S. Cl. 324—29.5 **12 Claims**



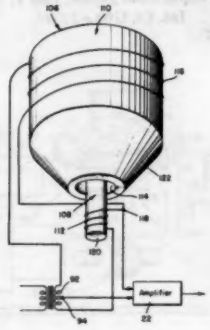
A detectable energy indicating means is disclosed having structure adapted to receive disc or button shaped energy sources such as, for example, those utilized for hearing aids. Encapsulated electrical current visual or audible sensing means serially connected to conductive contact means are assembled in an integral body of durable, pliable, and resilient thermoplastic or rubber materials. Translucent viewing means are defined in the body member to permit observation of the relative intensity of illumination of, for example, a light bulb sensor. Alternative embodiments provide for snap-in mounting of the tester in multiple battery cartwheel type packages for merchandising of the batteries as well as a handy rugged pocket unit for the individual user.

3,753,096

EDDY CURRENT FLAW DETECTION SYSTEM WITH LEFT OFF COMPENSATION

William Charles Wiers, Ann Arbor, Mich., assignor to Automation Industries, Inc., Century City, Calif.

Filed Feb. 4, 1971, Ser. No. 112,710
Int. Cl. G01r *33/12*
U.S. Cl. 324—40 **7 Claims**



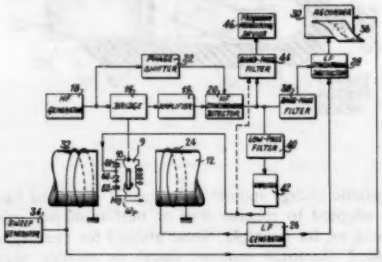
A nondestructive testing system of the eddy current variety is disclosed herein for inspecting workpieces for defects. A search unit is provided for use with the system for inducing eddy currents on the surface of the workpiece and sensing the fields reradiated from such currents to produce a corresponding test signal. The search unit includes one or more magnetic cores and one or more windings which are constructed and arranged to improve the response characteristics of the search unit to discontinuities in the surface of the workpiece. Also, they are constructed and arranged to eliminate or at least drastically reduce variations in the search unit response characteristics resulting from variations in the lift-off distance, i.e., the space between the search unit and the surface of the workpiece.

3,753,097

GYROMAGNETIC RESONANCE SPECTROMETERS

Jean Jacques Dunand, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 3, 1971, Ser. No. 204,485
Claims priority, application France, Dec. 4, 1970, 7043782
Int. Cl. G01n *27/78*
U.S. Cl. 324—0.5 R **5 Claims**



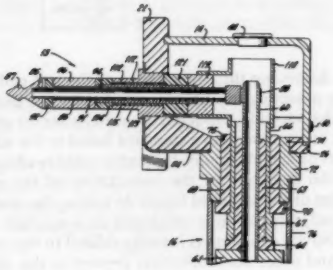
In a gyromagnetic resonance spectrometer where the specimen is rotated about an axis, and where the polarization field is modulated at a low angular frequency Ω, the synchronous detection of the HF components, in phase with the excitation, of the output signals from the resonant detector circuit gives a signal at the frequency Ω, a d.c. component, and a component at the rotation speed which, by means of filters, are respectively directed to the recorder, to a circuit correcting the resonance frequency of, or the coupling in, the resonant detector circuit, and to a rotation speed measurement system.

3,753,098

GUARDED OIL TEST CELL WITH TRIAXIAL CONNECTOR

Mahesh K. Sambhu, Wayne, and John J. Hinchey, Jersey City, both of N.J., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed May 8, 1972, Ser. No. 251,381
Int. Cl. G01r *27/02*
U.S. Cl. 324—65 P **4 Claims**



A guarded test cell for power factor measurement of oil including a connector adapted to receive a triaxial extension cable. The cell includes a housing within which a tubular center electrode, tubular guard electrode and a tubular outer electrode are concentrically and removably mounted. The housing also includes a cover having a removable plug mounted in an opening formed therein in alignment with the axis of the hollow center electrode. A connector, adapted to receive the triaxial extension cable, is also mounted in the housing generally at right angles to the electrodes. The connector is provided with electrically isolated contacts which engage, respectively, the electrodes of the cell. The cell electrodes are adapted to be immersed in oil samples, such as samples of elevated temperature, and the plug in the cover can be removed to permit insertion of a thermometer into the oil within the hollow center electrode. The extension cable allows the cell to be energized from a remotely located measuring unit.

3,753,099

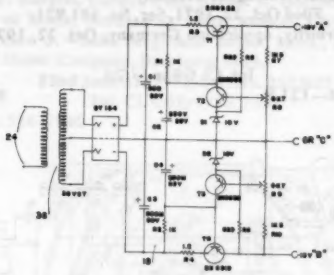
DEVICE AND METHOD FOR THE QUANTITATIVE MEASUREMENT OF FLUID ON PAPER STRIPS

Israel Kleinberg; Lorne M. Golub; Samuel M. Borden, and Morris Settler, all of Winnipeg, Manitoba, Canada, assignors to Harco Electronics Ltd., Winnipeg, Manitoba, Canada

Filed Apr. 28, 1972, Ser. No. 248,629
Int. Cl. G01r *27/26*
U.S. Cl. 324—61 QS **18 Claims**

A fixed and movable jaw form opposing plates of a capacitor with a paper strip carrying micro amounts of fluid being engaged between the jaws and acting as a dielectric whose characteristics (quality factor Q and relative dielectric constant E_r) change depending upon the amount of fluid present on the paper between the jaws. This capacitor is connected

with an electronic circuit which includes a digital readout meter. This meter reads the bias current on a transistor, the base



of which is connected in circuit with the capacitor thus enabling the quantity of fluid present on the paper to be read out in microlitres.

3,753,100

ACTIVE FREQUENCYMETER

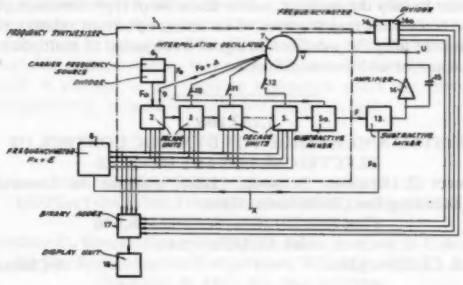
Roger Charbonnier, Meudon, France, assignor to Adret-Electronique, Trappes, France

Filed July 16, 1971, Ser. No. 163,154

Claims priority, application France, July 30, 1970, 7028299

Int. Cl. G01r *23/02*

U.S. Cl. 324—78 D **4 Claims**



Device for measuring frequencies, comprising a frequencymeter having a memory and digital outputs which programs an iterative frequency synthesizer. The latter comprises an interpolation oscillator switchable to a plurality of the decade units of the synthesizer. Means are provided for effecting a subtractive mixing of the synthesized frequency and the frequency to be measured and means are provided for controlling the frequency variation of the interpolation oscillator from the output of the mixing means. A second frequencymeter which has digital outputs measures the frequency increment of the interpolation oscillator.

3,753,101

FARADAY EFFECT CURRENT MEASURING DEVICE

Pierre Aumont, Aix-Les-Bains, France, assignor to Alstom-Savoisienne, Saint-Quen, France

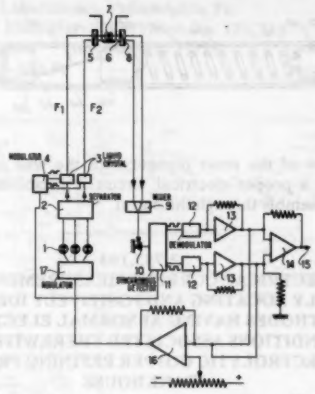
Filed July 5, 1972, Ser. No. 268,978

Claims priority, application France, July 5, 1971, 7124571

Int. Cl. G01r *31/00*

U.S. Cl. 324—96 **2 Claims**

Faraday effect current measuring devices having two optical paths characterized in that a single photoelectric cell may be used for the two optical paths. Liquid crystal sheets, in the two optical paths, are rendered alternately transparent and opaque at a very high frequency by an electric field controlled



by a modulator. As a result, a synchronized detector coupled to the output of the photoelectric cell separates the signals from the two optical paths.

3,753,102

DETECTION OF ELECTROSTATIC CHARGE IN FLOWING MATERIALS

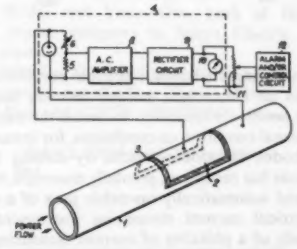
Maurice Sidney Beck, Bradford 9, Yorkshire, England, assignor to National Research Development Corporation, London, England

Filed Dec. 11, 1970, Ser. No. 97,182

Claims priority, application Great Britain, Dec. 15, 1969, 61,040/69

Int. Cl. G01r *5/28, 29/12*

U.S. Cl. 324—109 **12 Claims**



Electrostatic charge is detected in a turbulently flowing material by arranging an electrode so that there is induced on it a potential dependent on the charge concentration in the material, and sensing the magnitude of the alternating component of the induced potential due to the turbulence.

3,753,103

ELECTRICAL CIRCUIT TEST PROBE HAVING SPRING BIASED PROBE ASSEMBLY

Paul J. Tetreault, Seekonk, and Douglas R. Gobin, Attleboro, both of Mass., assignors to Crystal-Protronics Associates, Pawtucket, R.I.

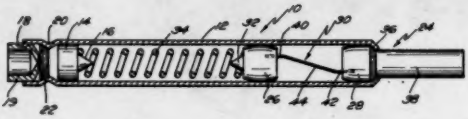
Filed Nov. 17, 1971, Ser. No. 199,707

Int. Cl. G01r *31/02*

U.S. Cl. 324—72.5 **5 Claims**

A device for testing electrical circuits including an elongated hollow barrel having a probe assembly mounted for axial movement in an end thereof, the probe assembly being urged outwardly of the barrel by a compression spring located

therein, and further including inner and outer plungers that are interconnected by a leaf spring that provides for firm engagement of the inner plunger with the wall of the barrel, wherein a proper electrical circuit is established from the probe assembly through the barrel.



3,753,104

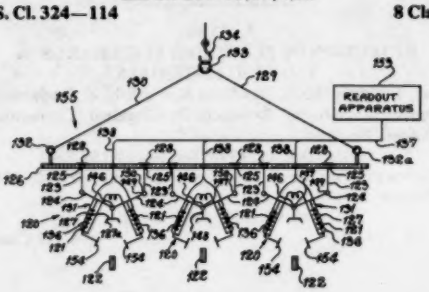
ELECTRICAL CURRENT MEASUREMENT AND RAPIDLY LOCATING AND POSITIVELY IDENTIFYING CATHODES HAVING ABNORMAL ELECTRICAL CONDITIONS ASSOCIATED THEREWITH IN AN ELECTROLYTIC COPPER REFINING PROCESS TANKHOUSE

Frank D. Shaw, Rumson, N.J., assignor to American Smelting and Refining Company, New York, N.Y.

Division of Ser. No. 1,108, Jan. 7, 1970, Pat. No. 3,652,935. This application Nov. 15, 1971, Ser. No. 198,513

Int. Cl. G01r *33/00, 1/22*

U.S. Cl. 324—114 **8 Claims**



Cathodes having abnormal electrical conditions associated therewith in an electrolytic copper refinery tank-house are rapidly and positively identified to enable the early remedying of the abnormal condition or conditions, for instance short circuited cathodes or poor contacts, by closing the normally open, cathode bar receptive, pivotally mounted, automatically closeable and automatically openable jaws of a sensing head of an electrical current measuring instrument, or of the sensing heads of a plurality of current measuring instrument units depending from a common supporting means of a current measuring apparatus, about one or more of a plurality of spaced apart cathode bars in the tankhouse and from which the cathodes are suspended and immersed in the electrolyte. The sensing head jaws are closed about the cathode bars by lowering the instrument or apparatus whereby shoes of the instrument's operating mechanism are forcefully applied against the cathode bar or bars due to the weight of instrument or apparatus parts, thereby automatically closing the jaws of the sensing head or heads to substantially encompass the cathode bar or bars. The current passing through each cathode bar is measured by utilizing the magnetic field created by the current passing through the cathode bar to induce a measurable e.m.f. and a measurable electrical current in conductive coils on non-magnetic cores of the sensing head jaws in a preferred embodiment. The current measurement value for the cathode bar or each of the cathode bars is compared with a predetermined desired current measurement value for its suspended cathode thereby positively identifying any cathode or cathodes having an abnormal electrical condition or conditions associated therewith.

3,753,105

SYSTEM FOR VARYING AN OSCILLOSCOPIC TRACE

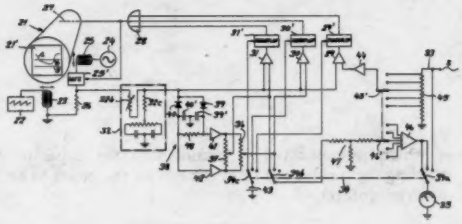
Peter Harzer, Eningen u.A., Germany, assignor to Wandel & Goltermann, Reutlingen, Germany

Filed Oct. 22, 1971, Ser. No. 191,921

Claims priority, application Germany, Oct. 22, 1970, P 20 51 791.3

Int. Cl. G01r *13/20*

U.S. Cl. 324—121 R **9 Claims**



The beam of a cathode-ray tube, normally suppressed, is electromagnetically deflected by a triangular current in the *x* direction and by a sinusoidal current in the *y* direction, thereby producing an invisible grid on the oscilloscope screen. Whenever the *y*-deflection signal matches either an input signal to be visualized or a selected reference signal, the beam is turned on for a small fraction of a *y*-sweep cycle to produce part of a luminous trace, representing the input signal, and a straight base line corresponding to the reference signal. In order to vary the position and/or the scale of representation of the trace with maintenance of its correct position relative to the base line, the *y*-deflection signal is subjected to multiplicative and/or additive modification.

3,753,106

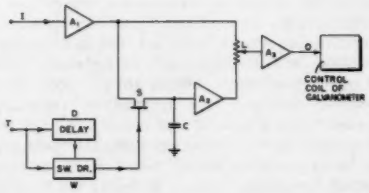
SYSTEM AND METHOD FOR DYNAMIC CONTROL OF ELECTRICAL ROTARY DEVICES

Pierre J. Brosens, Belmont, Mass., assignor to General Scanning, Inc., Watertown, Mass.

Filed Feb. 25, 1971, Ser. No. 118,640

Int. Cl. G01r *1/14*

U.S. Cl. 324—125 **6 Claims**



A method and system for obtaining precise step-wise motion in an electrical rotary device such as a moving-iron galvanometer, a stepping motor or other electrical device having a linear rotating response controllable by applied electrical pulses. Motion of the device is arrested exactly at the points desired by breaking down the actuating step into a sequence of two steps, the first being applied as the motion-initiating step, and the second being applied at the time of peak overshoot resulting from the first step. The second pulse is of a magnitude to exactly terminate motion at a half-period of resonant oscillation of the system.

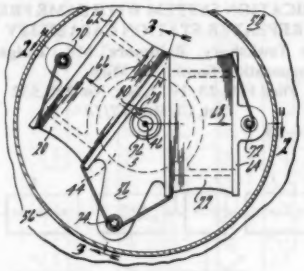
Signal-conditioning circuits for programming the sequence or time of application of the pulses and their amplitude include a storage circuit, an averaging circuit and a timing circuit to control the application of the sequence pulse.

3,753,107

MAGNETIC GAUGE WITH TWO V-POSITIONED COILS AND HAVING MAGNETIC RESTORING RING

James F. Burgett, Garden City; Gerald A. Gorrell, Dearborn, both of Mich.; Norman D. Mills, Atlantic City, N.J., and Lawrence J. Vanderberg, Ann Arbor, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed June 21, 1972, Ser. No. 265,027
Int. Cl. G01r 1/20, 1/00
U.S. Cl. 324—146 2 Claims



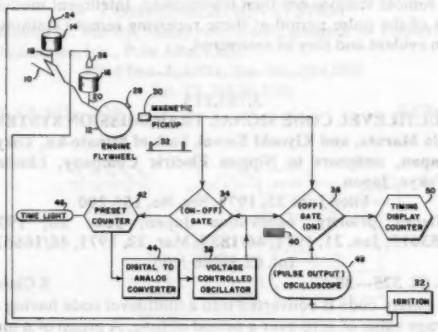
Magnetic gauge in which two electrical coils are positioned to form a V between them such that their axes intersect at a point intermediate and exterior of the coils. A permanent magnet is rotatable on a shaft which carries a pointer. The permanent magnet extends partially into each of the V-positioned coils and the vector resultant of the magnetic fields produced by currents in the coils determines the position of the rotatable magnet and the pointer carried by the shaft. A fixed resistor may be connected in series with one of the coils and a variable resistance may be connected in series with the other coil. A change in the variable resistance alters the current magnitude in its serially connected electrical coil.

3,753,108

MEANS AND METHOD FOR NUMERICALLY DISPLAYING THE TIMING OF IGNITION OR OTHER REPETITIVE EVENTS

Arthur C. Eberle, Upper Arlington, Ohio, assignor to Columbia Gas System Service Corporation, Wilmington, Del.

Filed Apr. 9, 1971, Ser. No. 132,750
Int. Cl. F02p 17/00
U.S. Cl. 324—16 R 12 Claims



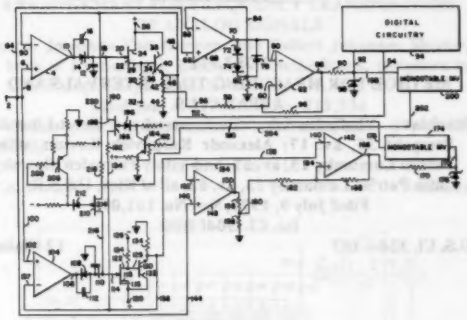
A digital ignition analyzer which calibrates the output frequency of a pulse generator with respect to the rotational speed of an engine, and then uses a counter to count the pulses from the generator during the time between ignition in a selected cylinder and a reference time. The count displayed on the counter gives a direct digital reading of the rotational angle between the reference point and the point of ignition.

3,753,109

PEAK DETECTOR

Julius Schainbaum, Philadelphia, Pa., assignor to Smith Kline & French Laboratories, Philadelphia, Pa.

Filed Mar. 8, 1971, Ser. No. 121,734
Int. Cl. G01r 19/16
U.S. Cl. 324—103 P 2 Claims



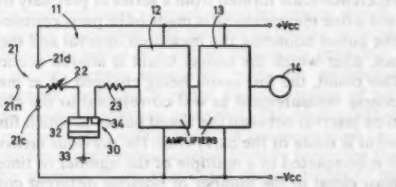
Circuitry is provided for distinguishing peaks in the amplitude of a time-varying signal. The circuitry includes a peak follower comprising a capacitor charged through a diode for storing peak values of the signal. A valley detection circuit is provided for resetting the peak follower following the occurrence of a valley in the signal. This prepares the peak follower for a new peak. A peak is determined to have occurred when the signal drops to an amplitude which is less than a predetermined percentage of the amplitude stored in the capacitor. The percentage is made to drop drastically at low signal levels to prevent noise from resulting in false indications of peaks.

3,753,110

TIMING APPARATUS USING ELECTROCHEMICAL MEMORY DEVICE

Hironosuke Ikeda, and Yosio Ooe, both of Hirakata-shi, Osaka-fu, Japan, assignors to Sanyo Electric Co., Ltd., Osaka-fu, Japan

Filed Dec. 22, 1971, Ser. No. 211,022
Claims priority, application Japan, Dec. 24, 1970, 45/127566; Dec. 24, 1970, 45/127567; Nov. 16, 1971, 46/91713
Int. Cl. G04f 9/00; H01g 9/00
U.S. Cl. 324—182 12 Claims



An electrochemical potential memory device comprising a cathode mainly comprising silver, an anode mainly comprising silver chalcogenide, and a silver ion conductive solid state electrolyte sandwiched therebetween is connected to a current source for selectively driving the device in a charging state or discharging state and to a high input impedance direct current amplifier responsive to the terminal voltage of the device, and a timing operation signal proportional to the lapse of the charging or discharging time is obtained from the amplifier.

In a preferred embodiment, the potential memory device comprises a main cathode for supply of the charging or

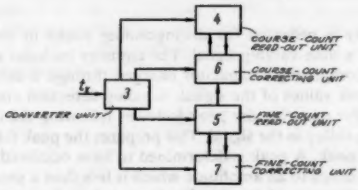
discharging current and an auxiliary cathode for detecting the terminal voltage of the device, the latter being connected to the high input impedance amplifier. The timing apparatus employing such device eliminates disadvantageous influence caused by an overvoltage as occurs at the time of current conduction in the device.

3,753,111

METHOD FOR MEASURING TIME INTERVALS AND APPARATUS

Stanislav Vladimirovich Denbnovetsky, Brest-Litovsky Prospekt 35, kv. 17; Alexandr Karpovich Kovtun, ulitsa Patrisa Lumumby 13, kv. 57, and Vitaly Petrovich Sigorsky, ulitsa Patrisa Lumumby 13, kv. 62, all of Kiev, U.S.S.R.

Filed July 9, 1971, Ser. No. 161,099
Int. Cl. G04f 9/00
U.S. Cl. 324—187 **12 Claims**



A method for measuring time intervals, by which the time interval of interest is coarsely measured by comparing it with a reference scale formed from a serves of precisely timed pulses, a fine measurement is then made of its parts contained between the pulses bounding the measured interval and the timed pulses, after which the coarse count is altered according to fine count, the fine count, the fine measurement being taken of the parts of the time interval contained between the pulses bounding it and those timed pulses the time interval between which is a multiple of the number of timed pulses at least equal to the number of possible different coarse counts of the same time interval.

A method for measuring time intervals, by which the time interval of interest is coarsely measured by comparing it with a reference scale formed from a series of precisely timed pulses, and a fine measurement is made of its parts contained between the pulses bounding the measured interval and the timed pulses, after which the coarse count is altered according to the fine count, the fine count being changed by as many units of coarse measurement as will correspond to the change of the time interval between the timed pulses to which fine measurement is made of the carry from the previous measurement, as it is completed to a multiple of the number of timed pulses at least equal to the number of possible different coarse counts of the same time interval, and this adjusted fine count is taken as that fine count which is used as a basis for the adjustment of the coarse count.

A device to realize the former method, comprising a time converter one output of which is connected to the input of a coarse-count readout means and the other output to the input of a fine-count readout means, characterized in that it comprises a coarse-count correcting means the inputs of which are connected to the outputs of the coarse- and fine-count readout means, respectively, and the output is connected to the input of the coarse-count readout means, while an apparatus realize the latter method additionally contains at least one fine-count correcting means whose input is connected to the output of the time converter and whose output to the input of the fine-count readout means.

ERRATUM

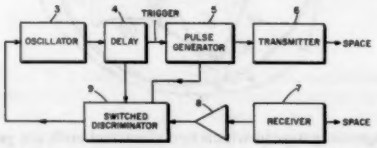
For Class 324—6 see:
Patent No. 3,753,134

3,753,112

COMMUNICATION SYSTEM WITH SAME FREQUENCY REPEATER STATION CAPABILITY

John Merle Tewksbury, Baltimore, Md., assignor to The Bendix Corporation, Southfield, Mich.

Filed Feb. 23, 1972, Ser. No. 228,532
Int. Cl. H04b 7/18
U.S. Cl. 325—13 **9 Claims**



A communication system with same frequency repeater station capability operates on a single channel and generally includes at least one repeater station which receives and transmits simultaneously on a single frequency, and a plurality of remote receiver transmitting stations, all of which operate on the same frequency as the repeater station. The repeater station includes a continuously operating transmitter, the keying of which is controlled by a local oscillator. Each of the remote stations includes a similar transmitter which is normally quiescent, but which is energized for local modulation and transmission by a push-to-talk button. Each cycle of the repeater station oscillator is modified by pulses received from a remote transmitting station, to reduce or increase the period as needed to produce identical periods and synchronization in each oscillator. The pulses received at the repeater station are not perceptible during its own transmission and hence, no control is then exerted. Hence, an equilibrium condition is immediately established at the repeater station in which the departure from coincidence of transmitted and received pulses at the repeater station is proportioned to its need for control. The transmissions from the repeater station are received by the remote stations not then transmitting. Intelligent modulation of the pulse period at these receiving remote stations is then evident and may be recovered.

3,753,113

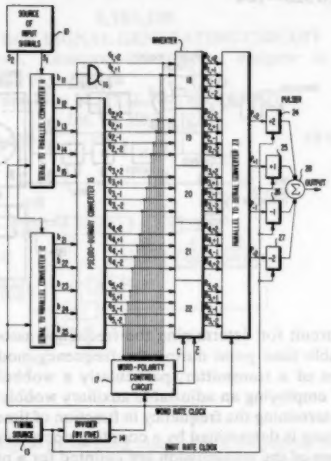
MULTILEVEL CODE SIGNAL TRANSMISSION SYSTEM

Rikio Maruta, and Kiyoaki Kawai, both of Minato-ku, Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed June 21, 1971, Ser. No. 155,200
Claims priority, application Japan, June 20, 1970, 45/53615; Jan. 21, 1971, 46/1852; Mar. 22, 1971, 46/16652
Int. Cl. H04b 1/00
U.S. Cl. 325—38 A **5 Claims**

A binary code is converted into a multilevel code having an average value of zero over a period of time. A group of n multilevel digits is generated representing the same information conveyed by $m \times n$ binary bits. Each digit is a (2^m+k)-level digit. One of said n digits represents the information content of $m-1$ binary bits as well as polarity inversion and synchronization information. The remaining $n-1$ multilevel digits represent the information content of the remaining $m(n-1+1$ binary bits. The integral of the transmitted n-digit codes is converged to zero level. The transmitted n-digit codes

are integrated by continually adding the sum of the levels of the transmitted code to the stored sum to generate a new sum or integral. The sign of the integral is compared with the sign of the sum of levels of the currently generated n-digit code. If the signs are the same, each digit of the n-digit code is polarity inverted. The first of the n digits uses only levels of one polarity when the $m-1$ binary bits are converted into a single multilevel digit. Consequently, whether or not any given n-digit code has been polarity inverted can be detected by detecting the polarity of the first digit. Thus, the first digit carries the



total information of m bits by using one of 2^m levels excluding k preselected levels. The remaining $(n-1)$ digits are not inhibited to use those preselected levels. However, the first digit is not at those preselected levels. This feature is used at a receiver to obtain word or block synchronization. At the receiver, a sync pulse is generated for every n digit received. If the receiver is synchronized properly, the sync pulse will be in time coincidence with the first digit of each n-digit code. The presence of one of those preselected levels in coincidence with any sync pulse indicates an out of phase condition and the sync pulse is shifted by one digit time.

3,753,114

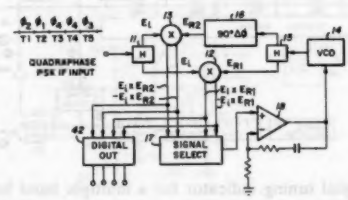
METHOD AND APPARATUS FOR THE RECOVERY OF SYNCHRONOUS CARRIER IN A DIGITAL COMMUNICATION SYSTEM

Cameron H. Burley, Sunnyvale, Calif., assignor to Culbertson Industries, Inc., Palo Alto, Calif.

Filed Dec. 2, 1971, Ser. No. 204,059

Int. Cl. H03d *3/06*

U.S. Cl. 325—320 **8 Claims**



A carrier recovery and coherent detection system in a digital communication system having a quadrature or biphase PSK incoming signal, the incoming signal being divided and transmitted to a pair of radio frequency mixers, these mixers receiving their reference inputs from a voltage controlled oscillator in a phase lock loop, one of the reference signals being phase shifted relative to the other. The outputs of the two mixers are utilized to produce a phase error signal in the phase lock feedback loop to the VCO to synchronize the VCO with the carrier signal. The mixer outputs serve to indicate the proper digital symbol output.

3,753,115

ARRANGEMENT FOR FREQUENCY TRANSPOSITION OF ANALOG SIGNALS

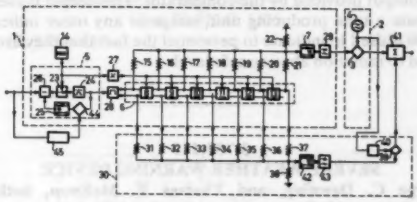
Petrus Josephus Van Gerwen, and Robert Johannes Sluyter, both of Emmasingel, Eindhoven, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Jan. 4, 1972, Ser. No. 215,334

Claims priority, application Netherlands, Jan. 27, 1971, 7101037

Int. Cl. H04b *1/10*

U.S. Cl. 325—323 **6 Claims**



In an arrangement for transposition of the frequency band of an analog signal the analog signal is first converted into a digital signal in an analog-to-digital converter. The digital output of the converter is connected to a multistage shift register operated with shift pulses having a pulse width less than half the pulse width of the highest frequency analog signal. A first weighting network is connected to each stage of the shift register and multiplies the information in the associated stage by a factor corresponding to a Fourier expansion of a desired transfer function resulting in a digital bandpass filter. The output of the weighting network is combined in a combination network and reconverted into analog form in a digital-to-analog converter. In order to correct for distortions due to the limited number of shift register stages at least one additional weighting network is connected to the shift register stages for providing a transfer function with the same bandwidth as the transfer function provided by the first weighting network, although the transfer function of the additional weighting network is shifted in phase with respect to that of the first weighting network. As with the first weighting network a digital-to-analog converter connected to a combining network for the additional weighting network provides analog signals. The analog signals associated with the first weighting network modulate the output signal of a carrier frequency generator, while the analog signals associated with the additional weighting network modulate a phase shifted version of the output of the carrier frequency generator. The phase shifted modulated carrier is then subtracted from the modulated carrier in an additional combining network thereby removing the objectionable portions of the modulated carrier produced by the distortions from the shift register and first first weighting network.

3,753,116

POCKET SIZE MICROWAVE RADIATION HAZARD DETECTOR

Richard B. Kolbly, Barstow, Calif., assignor to California Institute of Technology, Pasadena, Calif.

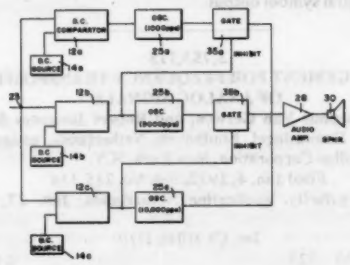
Filed Oct. 20, 1970, Ser. No. 82,369

Int. Cl. H04b *1/00*

U.S. Cl. 325—363 **2 Claims**

A microwave radiation hazard detector in which CW radiation is detected and converted into a DC voltage whose level is

a function of the radiation level. This signal's level is compared with an adjustable level of a DC voltage by a comparator to which the signals are DC coupled. Only when the level of the former exceeds the adjustable level is an alarm-indica-



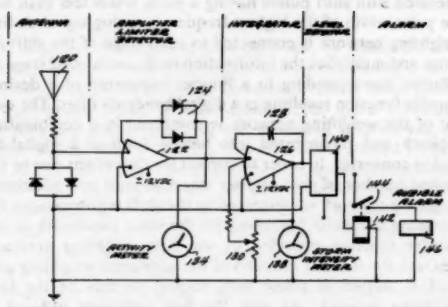
tion output provided by the comparator. This output is used to activate a tone producing unit, lamps or any other indicator which is used to indicate to personnel the fact that they are exposed to radiation above a safe level.

3,753,117

SEVERE WEATHER WARNING DEVICE

George C. Downing, and Thomas V. McEwen, both of Vicksburg, Miss., assignors to Weather Watch Corporation, Vicksburg, Miss.

Filed Oct. 27, 1971, Ser. No. 192,863
Int. Cl. H04b *1/06*
U.S. Cl. 325—364 **15 Claims**



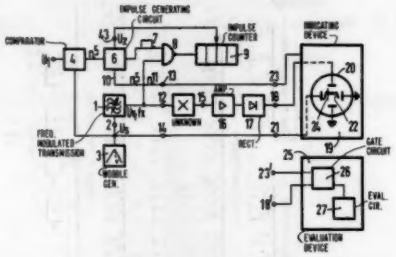
An apparatus for providing a severe weather warning particularly for providing warning of an imminent tornado, whereby a preferably nonmovable antenna receives electrical signals which result from the electrical activity which accompanies a storm. The signals thus received are amplified, limited in amplitude and integrated to derive a signal which, by its amplitude level, indicates the severity of storm activity. This integrated output signal is preferably applied to a level detector to provide an alarm signal when the integrated output level reaches a pre-determined level and further two meters are preferably connected to the output of the amplifier limiter circuit and the integrating circuit, respectively, for providing both an indication of storm activity and an indication of the severity of that activity. The output of the level detector circuit is preferably connected to an audible alarm which provides an audible alarm signal when the storm severity rises to a level indicating the imminence of a tornado. A non-interruptible power supply, which shifts from A.C. current normally supplied in a house to standby batteries when an outage occurs, preferably supplies the electrical power for the unit, which is self-contained and suitable for use in individual homes and the like.

3,753,118

CIRCUIT FOR DETERMINING THE FREQUENCY ASSIGNED TO A MARKABLE INSTANT OF A FREQUENCY-MODULATED TRANSMITTER

Karl Schlosser, Planegg, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed July 9, 1971, Ser. No. 161,014
Claims priority, application Germany, July 22, 1970, P 20 36 449.2; July 22, 1970, P 20 36 412.9
Int. Cl. H04b *1/02*
U.S. Cl. 325—134 **21 Claims**



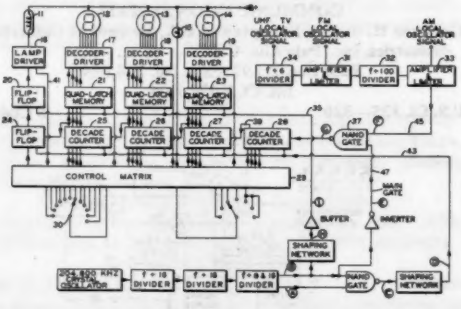
A circuit for determining the frequency associated with a markable time point during the frequency-modulated transmission of a transmitter, particularly a wobbulatable transmitter employing an adjustable auxiliary wobble-control voltage determining the frequency in function of time in which the frequency is determined by a counting operation in which the impulses of the transmission are counted for a predetermined period and in which a comparator impulse produced by comparison between a preset voltage and such auxiliary control voltage, which comparator impulse may be utilized directly or indirectly for marking purposes, is utilized to control the admission of impulses of such transmission to the counter for a predetermined period or periods.

3,753,119

DIGITAL TUNING INDICATOR

Ernest Frederick Close, Fort Wayne, Ind., assignor to The Magnavox Company, Ft. Wayne, Ind.

Filed Apr. 7, 1971, Ser. No. 132,012
Int. Cl. H04b *1/06*
U.S. Cl. 325—455 **13 Claims**



A digital tuning indicator for a multiple band heterodyne type receiving device is disclosed which is capable of displaying the frequency to which the receiving device is tuned for AM and FM reception in kilohertz to the nearest kilohertz and in megahertz to the nearest one-tenth megahertz respectively, and of displaying the channel to which the device is tuned when receiving UHF television. The indicating system comprises a counter, the contents of which are periodically dis-

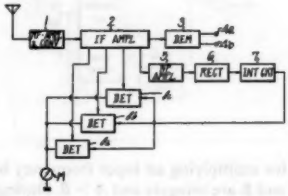
played. The counter contents are preset to a value which reflects the intermediate frequency of the particular band and a submultiple of the corresponding local oscillator frequency is gated into the counter for a prescribed time interval whereby the resultant sum in the counter at the end of the prescribed time interval reflects the actual received frequency or the corresponding channel number.

3,753,120

CONTROL SIGNAL GENERATING CIRCUIT

Mitsuo Ohsawa, Kanagawa-ken, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 11, 1971, Ser. No. 142,827
Int. Cl. H03j 1/02
U.S. Cl. 325—455 10 Claims



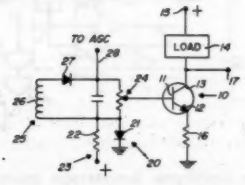
A control signal generating circuit for a frequency modulation receiver having a plurality of intermediate-frequency stages includes:a bandpass amplifier circuit, a circuit for rectifying an output signal of bandpass amplifier circuit to produce a bias signal, and a detector circuit for rectifying an intermediate-frequency signal to produce a control signal. The detector circuit is controlled by the bias signal. The amplitude of the control signal is a function of the intensity of a frequency modulated signal received by the frequency modulation receiver.

3,753,121

VARIABLY BIASED AUDIO AMPLIFIER

Francis H. Hilbert, Addison, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed May 3, 1971, Ser. No. 139,474
Int. Cl. H04b 1/16
U.S. Cl. 325—319 3 Claims



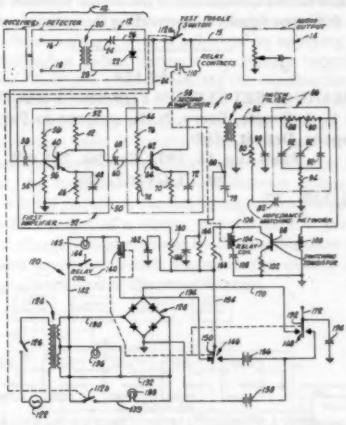
There is disclosed an audio amplifying output circuit for a receiver which includes biasing means for operating the output transistor to a minimum operating current level. The circuit is DC coupled to the preceeding stage as for example, the IF detector stage, so as to receive the DC component of the detected carrier signal. The DC component of the detected carrier signal is applied directly to the base of the transistor to increase its collector current in accordance with the amplitude of the driving signal thereby preventing transistor cutoff when signals of higher levels are received thereby.

3,753,122

FREQUENCY RESPONSIVE RADIO ACTUATOR FOR AUTOMATICALLY CONNECTING THE RECEIVER PORTION AND THE AUDIO PORTION

Kenneth C. Shackleford, P.O. Box 777, Camden, Ark.

Filed Mar. 31, 1971, Ser. No. 129,703
Int. Cl. H04b 1/06
U.S. Cl. 325—466 11 Claims

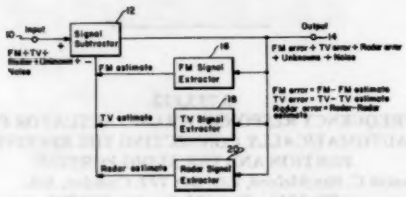


A radio actuator interposed between the receiver portion and the audio output portion of a radio to automatically establish electrical continuity therebetween when a signal having a predetermined actuating frequency is received by the receiver portion of the radio. The radio actuator has an amplifier network connected to the receiver portion to amplify the received signal, the amplified signal being transferred through an impedance matching network and a notch filter network to a switching transistor, the impedance matching network and the notch filter network cooperating to produce a maximum power transfer or gain thereacross at an actuating power level when the transferred signal has a frequency substantially the same as the actuating frequency. A signal having a power level substantially equal to the actuating power level drives the switching transistor into the saturation region passing current via the collector to a relay coil, thereby energizing the relay coil. The relay coil has a set of cooperating relay contacts interposed between the receiver portion and the audio output portion of the radio, the cooperating contacts being moved to the closed position in the energized position of the relay coil, thereby automatically turning the radio to an "on" position.

3,753,123
SIGNAL SORTING SYSTEM

Daniel D. Carpenter, Manhattan Beach; Jean A. Develet, Jr., Palos Verdes Peninsula, and Robert Y. Huang, Palos Verdes, all of Calif., assignors to T. R. W. Inc., Redondo Beach, Calif.

Filed Oct. 16, 1970, Ser. No. 81,194
Int. Cl. H04b 1/16
U.S. Cl. 325—476 28 Claims

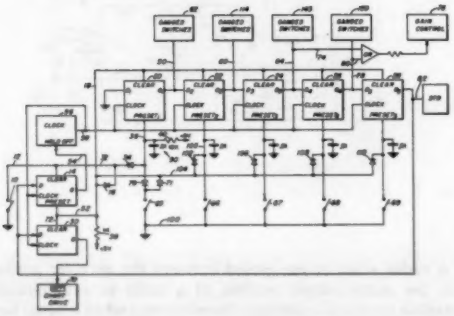


A signal sorting system having a signal summer for vectorially subtracting from input signals estimate signals of the input signals to provide error signals at its output, and a plurality of signal extractors connected to the signal summer and responsive to the error signals for providing the estimate signals.

3,753,124
MANUAL SET SYSTEM FOR SHIFT REGISTER

Ernest F. J. Graetz, Derry, N.H., assignor to Parke Davis & Company, Detroit, Mich.

Filed Aug. 16, 1972, Ser. No. 281,075
Int. Cl. G11c 11/00
U.S. Cl. 328—37 8 Claims

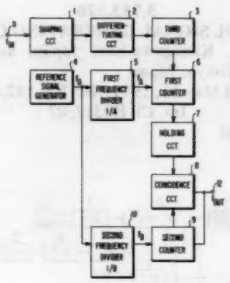


The specific disclosure provides a manual set system for a shift register wherein a manually operable switch is moved to a first position to connect both CLEAR and PRESET input terminals of a flip-flop to an activation signal source consisting of either a logical 0 or a logical 1 signal. The switch has a second position for connecting both CLEAR and PRESET terminals to a deactivation signal source which generates either a logical 0 or a logical 1 signal opposite to that of the activation signal source. The circuit also comprises electrically conductive components in circuit between the deactivation signal source and one of the CLEAR and the PRESET input terminals for passively delaying initiation of the deactivation signal thereon. This delay of the deactivation signal latches a logical signal at the output terminal of the flip-flop when the deactivation signal is fully developed at the other of the CLEAR and PRESET input terminals.

3,753,125
FREQUENCY MULTIPLIER CIRCUIT

Masashi Ishikawa, and Kunihiko Ota, both of Tokyo, Japan, assignors to Nippon Electric Company Limited, Tokyo, Japan

Filed July 27, 1972, Ser. No. 275,668
Int. Cl. H03k 5/13
U.S. Cl. 328—38 6 Claims
Claims priority, application Japan, July 27, 1971, 46/56613

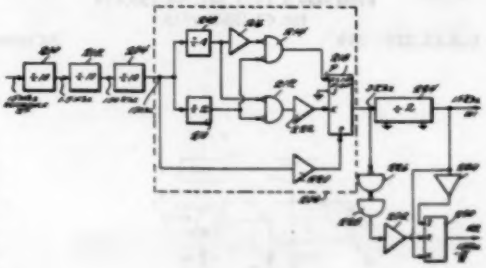


Apparatus for multiplying an input frequency by a number A/B where A and B are integers and $A > B$. During one period of the input frequency, f_{in} , pulses at a rate fo/A are accumulated and held. Pulses at a rate fo/B are continuously counted and for each P pulses of said latter pulses an output pulse is generated. Since P is the number of fo/A rate pulses occurring during one period of f_{in}, the output pulse rate is $f_{in} \times A/B$. Additional means are provided for averaging the period of f_{in} by counting the fo/A rate pulses for a multiple of periods of f_{in} and obtaining the number P occurring during a single period by effectively dividing the accumulated pulses by said multiple.

3,753,126
SIGNAL FREQUENCY DIVIDER WITH DUAL PHASE-DISPLACED SIGNAL OUTPUT

Robin H. Hines; William L. Hollinshead, and Thomas O. Bolden, all of Tullahoma, Tenn., assignors to Laser Systems & Electronics, Inc., Tullahoma, Tenn.

Division of Ser. No. 18,101, March 10, 1970. This application Nov. 19, 1971, Ser. No. 200,532
Int. Cl. H03k 29/00
U.S. Cl. 328—41 1 Claim



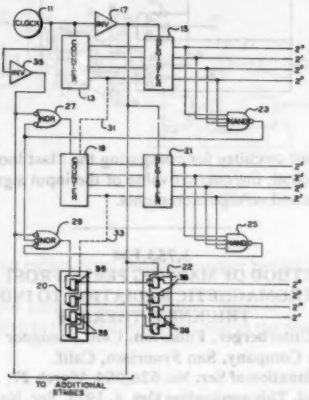
Signal frequency divider apparatus is provided which yields a pair of electrical signals having a fixed phase relationship with one another and having a constant frequency ratio with a radio frequency input signal. The resulting phase-displaced signals are useful in deriving a modulating signal of high stability through combination with the orignal radio frequency signal in double-balanced mixers.

3,753,127

PSEUDOSYNCHRONOUS COUNTER

John J. Rowe, Bowie, Md., assignor to The Singer Company, Binghamton, N.Y.

Filed Dec. 27, 1971, Ser. No. 212,031
Int. Cl. H03k 21/10
U.S. Cl. 328—42 5 Claims



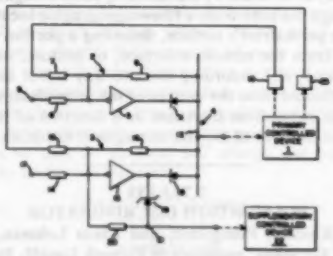
The disclosure describes a counter which uses ripple counters but still provides a synchronous output through the use of a buffer stage which is loaded at the end of a clock pulse at which time the count will have settled is shown. Additional stages are provided with inputs from a gate enabled by a count of all ones in the previous buffer to permit the total settling time to equal that of one stage.

3,753,128

GATED AMPLIFIER CONTROL WITH PROVISION FOR SUPPLEMENTARY CONTROL

Daniel Johnson, Guilderland, and Arne Loft, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 8, 1972, Ser. No. 250,911
Int. Cl. H03k 17/02
U.S. Cl. 328—71 7 Claims



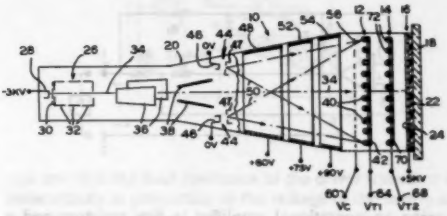
Two or more operational amplifiers with provision for closed loop feedback control of a primary controlled device are provided with a gating circuit which permits only one of the amplifiers to control at any one time. One or more of the amplifiers further includes a supplementary feedback circuit which becomes operative when the amplifier loses control of the primary device. This places the amplifier in control of a supplementary controlled device.

3,753,129

STABILIZATION OF PREPARE VOLTAGE OF TRANSMISSION STORAGE TARGET

Bozidar Janko, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jan. 24, 1972, Ser. No. 220,060
Int. Cl. G11c 11/26; H01j 29/41
U.S. Cl. 328—123 10 Claims



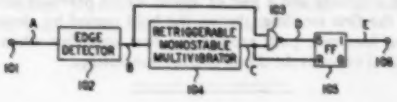
A method and apparatus for improved operation of a transmission storage tube are described in which the preparation voltage provided on the storage dielectric prior to writing is stabilized to a substantial uniform value slightly positive of the flood gun cathode voltage. This is achieved by applying a plurality of stabilization pulses between the storage target electrode and the flood gun cathode during the bombardment of the storage dielectric by flood electrons, such pulses having a peak voltage greater than the first crossover voltage so the secondary emission ratio is greater than unity and having a quiescent voltage less than such first crossover voltage. In one embodiment, the frequency of the stabilization pulses is increased for a brief period at the beginning of the preparation period. The first target of a charge transfer tube is prepared for writing a charge image thereon by the stabilization pulses of the present invention which increases the quality of the charge image transferred to the second target.

3,753,130

DIGITAL FREQUENCY COMPARATOR

David August Pezzutti, Eatontown, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Int. Cl. H03k 5/20
U.S. Cl. 328—141 10 Claims

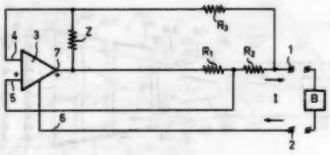


A digital frequency comparator is realized by employing a retriggerable monostable multivibrator in combination with a coincidence gate. The timing interval of the monostable multivibrator is set at a predetermined value corresponding to a desired reference frequency. When the frequency of an applied signal is greater than the reference, the monostable is retriggered prior to timing-out. Consequently, signals applied to the gate are periodically in coincidence, thereby indicating that the frequency of the applied signal is greater than the reference.

3,753,131
CURRENT SOURCE FOR SUPPLYING A CURRENT HAVING AN EXPONENTIAL WAVE FORM

Pieter Kramer, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 30, 1971, Ser. No. 214,286
Claims priority, application Netherlands, Jan. 8, 1971, 7100277
Int. Cl. G06g 7/24
U.S. Cl. 328—145 3 Claims

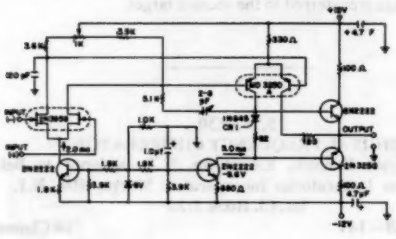


By using an operational amplifier, a few resistors and a reactance a current source is obtained which supplies a current having an exponential waveform. The current source may be used in analogue computers for operations with logarithms, in apparatus for testing semiconductors and in measuring instruments provided with a logarithmic display.

3,753,132
SAMPLE-AND-HOLD CIRCUIT

Eugene R. Hill, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Mar. 2, 1972, Ser. No. 231,310
Int. Cl. H03k 5/18, 17/04, 17/08
U.S. Cl. 328—151 5 Claims



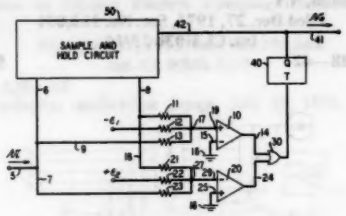
A sample-and-hold circuit which comprises a first input amplifier, a switch connecting a second amplifier to the output of the first amplifier and a pair of diodes which prevents saturation of the first amplifier during the hold period by closing a negative feedback path around the first amplifier when the signal level exceeds the diode conduction voltage.

3,753,133
TRIGGER CIRCUIT FOR RECORDING AND TRANSMITTING SAMPLED ANALOG WAVEFORMS

Paul William Shumate, Jr., Basking Ridge, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Apr. 5, 1972, Ser. No. 241,204
Int. Cl. H03k 5/08, 5/153, 13/17
U.S. Cl. 328—151 10 Claims

A trigger circuit is provided for generating a digital pulse each time the amplitude of an analog input signal increases by an amount greater than a first voltage increment or decreases by an amount greater than a second voltage increment. The circuit features a sample and hold circuit in combination with a pair of operational amplifiers having current summing points



in their input circuitry for comparing the "last look" value of the input signal, the current value of the input signal, and the first and second voltage increments.

3,753,134
METHOD OF MAPPING PERMAFROST BY ELECTROMAGNETIC RADIATION TO INDICATE THICKNESS THEREOF

Robert R. Unterberger, Fullerton, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 626,084, March 27, 1967, abandoned. This application Oct. 4, 1971, Ser. No. 186,376
Int. Cl. G01v 3/12, 3/16
U.S. Cl. 324—6 2 Claims

A method for accurately and quickly mapping the thickness of the permafrost zone of an earth formation from a movable vehicle, say an aircraft, by transmitting electromagnetic radiation through the zone from a known geographic location on or above the permafrost's surface, detecting a portion of energy reflected from the remote interface, or bottom, of the permafrost zone, and recording the two-way travel time of the energy reflected from the bottom of the permafrost zone so as to indicate permafrost thickness as a function of the known geographic location of the electromagnetic radiation system.

3,753,135
PULSE WIDTH DISCRIMINATOR

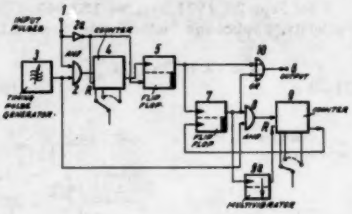
Gerhard Kastner, Pfungstadt, and Klaus Lohman, Langen, both of Germany, assignors to Fernseh GmbH, Darmstadt, Germany

Filed Oct. 26, 1971, Ser. No. 192,239
Claims priority, application Germany, Oct. 27, 1970, P 20 52 600.5
Int. Cl. H03k 9/08
U.S. Cl. 329—106 10 Claims

An output pulse connects a timing pulse source to a first counter. A first flip flop produces a 1 level when a predetermined count is exceeded. A negative transition of the input pulse interrupts the timing pulses, resets the first counter and places the first flip flop at 0.

A second flip flop is shifted to a 1 level by a negative transition of the first flip flop. At the same time a second counter begins counting timing pulses. The second counter resets the second flip flop to zero, when a predetermined count is reached.

1 level outputs of both flip flops are combined in an OR gate.



Short input pulses reset the first counter before any 1 levels are achieved.

Wide input pulses are transmitted, delayed by an interval corresponding to the selection width and to the predetermined count.

3,753,136

SOLID STATE TRAVELING WAVE AMPLIFYING DEVICE

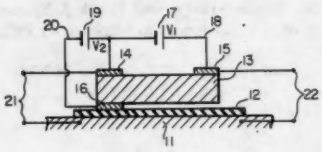
Kenji Kumabe, Kodaira, Hiroshi Kanbe, Tanashi, and Riro Nii, Tokyo, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Feb. 12, 1971, Ser. No. 114,970

Claims priority, application Japan, Feb. 24, 1970, 45/15336; Sept. 28, 1970, 45/84546

Int. Cl. H03f 3/04

U.S. Cl. 330—5 **9 Claims**



This invention relates to a solid state travelling wave amplifying device, utilizing such a semiconductor as *n*-type GaAs or *n*-type InP in which average velocity of electrons decreases with increasing electric field strength when an electric field of which field strength being higher than a critical value is applied, said semiconductor is provided with additional ohmic electrode or electrodes at input side and/or output side in addition to main electrodes comprising positive and negative electrodes so that an external DC energy will be supplied through the additional electrode.

3,753,137

AMPLIFIER

Johann Mattfeld, Kirchhausen, and Frank Pieper, Schwaigern, both of Germany, assignors to Licentia, Patent-Verwaltungs G.m.b.H., Frankfurt am Main, Germany

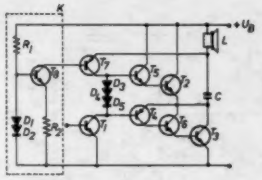
Filed Mar. 12, 1971, Ser. No. 123,769

Claims priority, application Germany, Mar. 23, 1970, P 20 12 829.8

Int. Cl. H03f 3/26

U.S. Cl. 330—15 **9 Claims**

An amplifier comprises a class-B push-pull transistor output stage controlled by a driver transistor, means for maintaining the quiescent collector current of the output stage transistors independent of temperature fluctuations in the output stage transistors, the load resistance of the driver transistor being provided by the collector-emitter path of an additional transistor. A constant current supply is connected to the base of the additional transistor such that its collector-emitter voltage and thus the load resistance of the driver transistor varies substantially in proportion to the voltage of the supply source whereby the quiescent collector current in the transistors of the output stage is independent of fluctuations in the supply voltage.



3,753,138

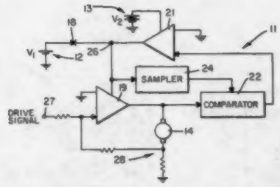
AMPLIFIER SYSTEM WITH CONTINUOUSLY VARIABLE SUPPLY

Gordon D. Svendsen, San Carlos, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed June 3, 1971, Ser. No. 149,497

Int. Cl. H03f 3/68

U.S. Cl. 330—30 R **9 Claims**



A voltage comparator compares the operating voltage provided to a power amplifier to a voltage representative of that appearing across a load. A unity gain linear amplifier is coupled between a voltage source and the power amplifier that is responsive to the voltage comparator to maintain the operating voltage provided to the power amplifier sufficient to deliver the required current to the load.

3,753,139

COMBINED TEMPERATURE COMPENSATION AND ZERO-OFFSET CONTROL

William H. Spencer, Monrovia, Calif., assignor to Bell & Howell Company, Chicago, Ill.

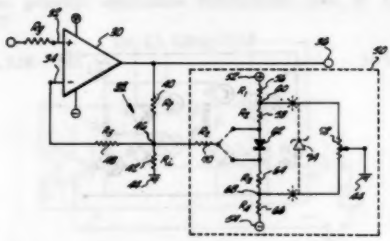
Filed May 13, 1971, Ser. No. 143,024

Int. Cl. H03f 3/36

U.S. Cl. 330—69 **7 Claims**

A temperature compensating and zero-offset control circuit for an operational amplifier includes a floating diode in combination with a potentiometer. The diode exhibits a repeatable temperature coefficient which is a negative one at the anode

and a positive one at the cathode. The zero-offset is accomplished by adjusting the dc level at which the diode floats with



reference to the dc level of the amplifier. The output of the circuit is applied as one of the feedback inputs to the amplifier.

3,753,140

EQUALIZING NETWORK

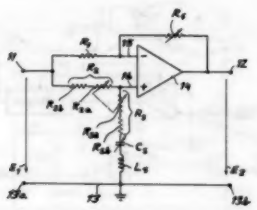
Karl Heinz Feistel, Eningen, Germany, assignor to Wandel & Goltermann, Reutlingen, Germany

Filed Sept. 7, 1971, Ser. No. 178,182

Claims priority, application Germany, Sept. 9, 1970, P 20 44 553.8

Int. Cl. H03f 1/36

U.S. Cl. 330—109 **10 Claims**



An equalizing network for correcting phase and amplitude distortions is constructed as a four-terminal T-section with the input-side series arm and the shunt arm composed of passive impedance elements and with the output-side series arm constituted by an operational amplifier having its ungrounded output terminal connected to its inverting input terminal through a resistive feedback path. The inverting and noninverting input terminals of the amplifier are connected to the ungrounded network input through respective branches of the passive series arm. A variable capacitance forming part of a series-resonant circuit in the shunt arm, or a variable inductance forming part of a parallel-resonant circuit in one of the branches of the passive series arm, serves for selection of the frequency of maximum attenuation; the magnitude of this attenuation is controlled by an adjustable resistor in the feedback path. Selection of the phase delay is carried out with the aid of two ganged resistors in the shunt arm and in the series branch feeding the noninverting amplifier input, or by means of a single adjustable resistor common to this branch and the shunt arm.

3,753,141

WIDE FREQUENCY RANGE VOLTAGE CONTROLLED OSCILLATOR WITH CRYSTAL CONTROLLED FREQUENCY STABILIZING LOOP

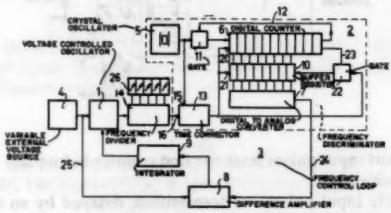
Cornelis Johannes Van Elk; Jacob Frederik Raaigever; Jan Gijsbert Dirk Van Der Lee, and Albertus Marinus Morrien, all of Hilversum, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 20, 1971, Ser. No. 182,067

Claims priority, application Netherlands, Sept. 24, 1970, 7014066

Int. Cl. H03b 3/04

U.S. Cl. 331—1 A **10 Claims**



A controllable broad-band frequency generator comprising a voltage-controlled oscillator incorporated in a frequency controlled loop and an external controllable voltage source connected thereto, the control loop furthermore incorporating a digital crystal stable frequency discriminator and a combination device in which the direct voltage value derived from the voltage source is deducted from the output voltage provided by the frequency discriminator to obtain a direct control voltage for frequency controlling the voltage-controlled oscillator.

3,753,142

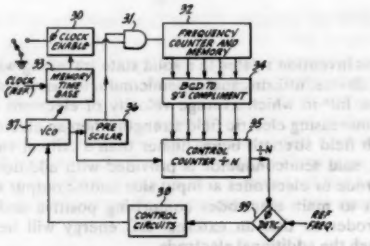
SIGNAL GENERATORS EMPLOYING DIGITAL PHASE LOCKED LOOPS AND COMPENSATING CIRCUITS

Roy Nardin, Middle Village, and Frank J. Sposato, Huntington, both of N.Y., assignors to Logimetrics Inc., Greenvale, N.Y.

Filed June 12, 1972, Ser. No. 262,248

Int. Cl. H03b 3/04

U.S. Cl. 331—1 A **8 Claims**



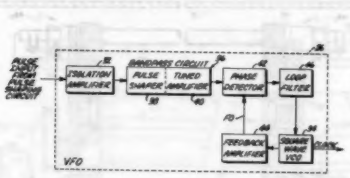
There is described a signal generator capable of being tuned over a relatively high frequency range. The generator includes a VCO which is controlled in frequency by a phase locked loop. The loop operates to compare a reference frequency from an accurate crystal source with the divided oscillator frequency. The division is afforded by a first frequency counter which controls a programmable divider to cause the same to divide by the correct integer independent of the oscillator tuning. The phase locked loop includes a phase detector responsive to digital waveforms to provide a dual polarity error control signal by combining outputs of the phase detector in a differential operational amplifier. The operational amplifier is further controlled to cancel an error offset voltage so that the final output signal is free from spurious modulation products.

3,753,143

PHASE LOCKED OSCILLATOR FOR INTEGER PULSE RATES

Michael C. Aguirre, Oklahoma City, Okla., assignor to Honeywell information Systems, Inc., Waltham, Mass.

Filed Aug. 5, 1971, Ser. No. 169,195
Int. Cl. H03b 3/04
U.S. Cl. 331—8 11 Claims



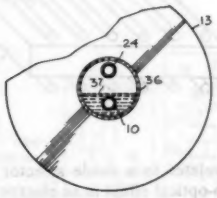
A phase locked oscillator for locking to a train of pulse signals where the pulse repetition rates are integer multiples of each other. The input pulse signals are directed to a bandpass circuit, a tuned amplifier, the center frequency of which is selected to be the same as the reference frequency of a phase detector. The output signal of the bandpass circuit is a sinusoidal signal directed to the gated or multiplier phase detector. A square wave voltage controlled oscillator has a portion of its output signal fed back to the phase detector. The output of the phase detector controls the frequency of the voltage controlled oscillator. In the phase locked loop, the square wave voltage controlled oscillator is locked to a reference frequency from the bandpass circuit independent of an integer change in the pulse repetition rate of the input pulse train signals.

3,753,144

GAS LASER STRUCTURE

William J. Kearns, 400 N. Old Ranch Rd., and Andrew O. Jensen, 2134 Canyon Rd., both of Arcadia, Calif.

Division of Ser. No. 4,178, Jan. 14, 1970, abandoned, which is a continuation of Ser. No. 503,232, Oct. 13, 1965, abandoned.
This application Oct. 18, 1971, Ser. No. 190,301
Int. Cl. H01s 3/00
U.S. Cl. 331—94.5 O 3 Claims



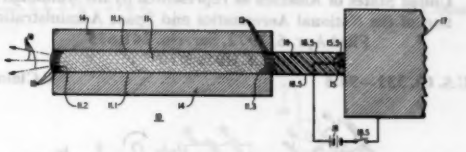
This application relates to a gas laser structure having an insulating, heat resistant discharge tube having means associated therewith for transferring heat therefrom during lasing operation. In a first embodiment, cooling fins are attached to the outer surface of the discharge tube. In further embodiments, the fins extend through the outer discharge tube wall and are either formed to provide, among the plurality of fins, an inner discharge tube or are connected to substantially cylindrical discharge tube sections. In still a further embodiment, a boiler-condenser——vapor cooling technique structure is disclosed. Means to equalize the pressure between the opposite ends of the laser structure is also disclosed.

3,753,145

COMPACT END-PUMPED SOLID-STATE LASER

Ronald Benjamin Chesler, Summit, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed June 26, 1972, Ser. No. 265,978
Int. Cl. H01s 3/09
U.S. Cl. 331—94.5 10 Claims



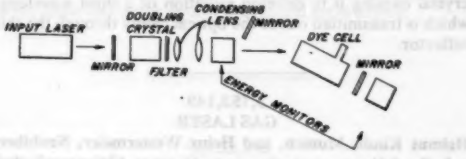
A cylindrically shaped rod of neodymium doped yttrium aluminum garnet (Nd:YAG) is pumped into laser operation by means of an incoherent light emitting semi-conductor diode, or array of such diodes, whose output is compactly coupled to the rod through an end surface of the rod.

3,753,146

NOVEL VISIBLE SPECTRUM DYE LASERS

George A. Reynolds; Sam A. Tuccio; Otis G. Peterson, and Donald P. Specht, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 15,489, March 2, 1970, abandoned.
This application Oct. 18, 1971, Ser. No. 190,304
Int. Cl. H01s 3/20
U.S. Cl. 331—94.5 13 Claims



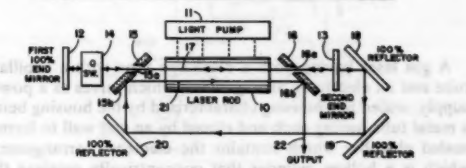
A lasing medium is disclosed containing certain pyrylium and benzopyrylium organic dyes which are capable of laser emission in the 500–600 nanometer region.

3,753,147

LASER OSCILLATOR-AMPLIFIER SYSTEM

Carl William Schulthess, Pomona, Calif., assignor to Union Carbide Corporation, New York, N.Y.

Filed June 23, 1972, Ser. No. 265,665
Int. Cl. H01s 3/02
U.S. Cl. 331—94.5 8 Claims



An aperture plate having a central aperture and a 100 percent reflecting surface surrounding the central aperture is placed in the optical cavity of a laser rod to thereby confine generation of a laser beam to only a first portion of the rod that is in optical alignment with the central aperture. Laser light is directed through a second portion of the rod spaced from and parallel to the first portion so that it misses the central aperture and is intercepted and reflected by the 100% reflecting surface of the aperture plate, the laser light being

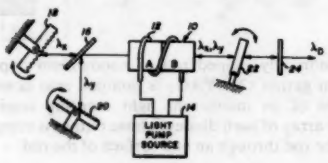
amplified in the second portion so that a method and means are provided for both generation and amplification of laser light in a single laser rod.

3,753,148

INFRARED TUNABLE LASER

Kenneth W. Billman, Mountain View, Calif., assignor to the United States of America as represented by the Administration of the National Aeronautics and Space Administration

Filed Apr. 6, 1972, Ser. No. 241,615
Int. Cl. H01s 3/10
U.S. Cl. 331—94.5 8 Claims



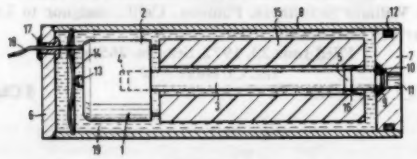
A tunable laser apparatus including a first wavelength selective reflector and a second wavelength selective reflector forming one end of an optical cavity, a third wavelength selective reflector forming the other end of the optical cavity, a first lasable dye solution for developing radiation of a wavelength selected by the first reflector and a second lasable dye solution for developing radiation of a wavelength selected by the second reflector disposed within the optical cavity, and a non-linear mixing crystal disposed within the optical cavity. The selected radiation is passed through the non-linear mixing crystal causing it to develop radiation of a third wavelength which is transmitted out of the optical cavity through the third reflector.

3,753,149

GAS LASER

Helmut Kindl, Munich, and Heinz Westermeier, Neubiberg, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed July 29, 1971, Ser. No. 167,295
Claims priority, application Germany, Aug. 11, 1970, P 20 39 947.7
Int. Cl. H01s 3/00
U.S. Cl. 331—94.5 G 10 Claims



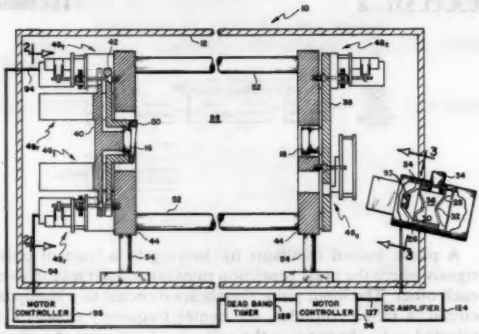
A gas laser having both a discharge tube with a capillary tube and an electronic arrangement, which serves as a power supply, sealed in a housing characterized by the housing being a metal tube having each end closed by an end wall to form a sealed chamber which contains the electronic arrangement which is a hollow cylinder that concentrically receives the capillary tube. Preferably, the chamber of the housing is filled with an electrically insulating and heat conducting material which is either a liquid or cast therein. The electronic arrangement preferably comprises the elements of the arrangement embedded in a cast plastic material which is cast in a hollow cylinder. One of the end walls of the housing contains the decoupling window and has a conical recess therearound for receiving a free end of the capillary tube which is sealed by an O-ring sealing ring and which is urged into engagement with the conical recess by a spring plate disposed in the housing.

3,753,150

LASER MIRROR POSITIONING APPARATUS

Jacob L. Zar, North Andover, Mass., assignor to AVCO Corporation, Everett, Mass.

Filed Sept. 6, 1972, Ser. No. 286,724
Int. Cl. H01s 3/08
U.S. Cl. 331—94.5 18 Claims



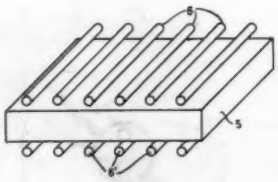
The coupling, return and transfer mirrors within a high-powered laser housing each are mounted to a frame at three stations 120° apart. Step motors at two of the stations are energized from the housing exterior to displace the mirrors and thus vary their orientation. The transfer mirror is oriented to point an output laser beam through an opening in the housing by a control system responsive to the distribution of heat around the opening to control the step motors for the transfer mirror.

3,753,151

MODE SELECTOR FOR SCAN LASER

Gunter Schulten, Wedel, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 2, 1972, Ser. No. 259,191
Claims priority, application Germany, June 3, 1971, P 21 27 463.5
Int. Cl. G02f 1/26
U.S. Cl. 350—160 4 Claims

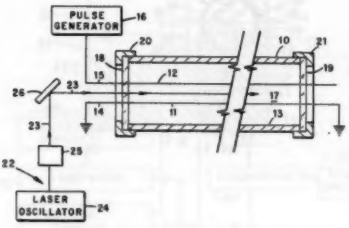


The invention relates to a mode selector having a plate showing an electro-optical effect in an electric field to control the modes of oscillation in a scan laser. The new mode selector consists of two identical selectors which are rotated relative to each other through 90° and which are each arranged in a focal plane of the laser-resonator and of which one controls the *x* coordinate and the other controls the *y* coordinate of the focus, in which a plate-shaped electro-optical KDP material is surrounded by grid-shaped electrodes between which electric fields are produced which, with the exception of a strip-shaped region, everywhere exceed a certain minimum intensity but disappear or are very small in the strip-shaped region. The electrodes are two grids of parallel wires and the individual wires have such a potential that either a transverse or a longitudinal electro-optical effect occurs in the electro-optical material.

3,753,152
ELECTRICAL WAVE PUMPED PULSED LASER

Kenneth J. Pettipiece, Brentwood, Calif., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Feb. 2, 1972, Ser. No. 222,785
Int. Cl. H01s 3/09
U.S. Cl. 331—94.5 20 Claims

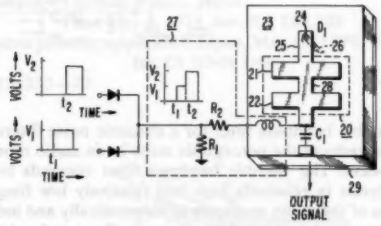


A pulsed laser wherein emission is generated from a gaseous gain medium, the gain medium being pumped by at least one traveling high voltage electromagnetic pulse having a duration too short for inducing formation of an ionization discharge in the medium. The gaseous gain medium is contained in a vessel having a pair of conductors which provide a waveguide for conducting the electromagnetic pulse through the gaseous gain medium. Pulsed laser emission is obtained in an oscillatory mode or in an amplification mode.

3,753,153
DOUBLE PULSE BIAS STABILIZATION OF A MICROWAVE OSCILLATOR USING AN AVALANCHE DIODE OPERATIVE IN THE ANOMALOUS MODE

Shing-Gong Liu, Princeton, and John Joseph Risko, Cranbury, both of N.J., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Apr. 21, 1972, Ser. No. 246,470
Int. Cl. H03b 7/14
U.S. Cl. 331—107 R 6 Claims

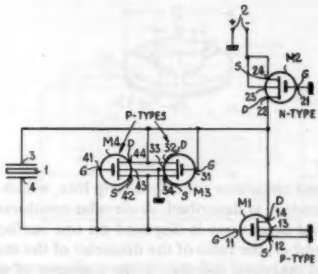


The operation of a microwave oscillator using an avalanche diode operative in the anomalous mode is stabilized by the use of a double pulse, direct current bias signal. The double pulse bias signal first triggers the anomalous mode of diode operation with minimum oscillator instability and reduced oscillator output power, thereafter causing the anomalous mode of diode operation to continue without increasing the oscillator instability but increasing the oscillator output power.

3,753,154
CRYSTAL-CONTROLLED OSCILLATORS

Jean Pierre A. Moreau, and Georges Schuler, both of Paris 16eme, France, assignors to Sescosem-Societe Europeene de Semiconduteurs et de Microelectronique, Paris, France

Filed Feb. 2, 1972, Ser. No. 222,778
Claims priority, application France, Feb. 17, 1971, 7105365
Int. Cl. H03b 5/36
U.S. Cl. 331—116 R 6 Claims

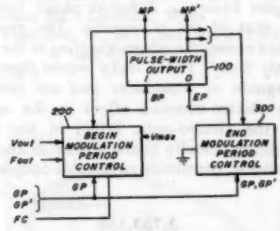


A crystal-controlled oscillator of integrated circuit design, comprising, on the one hand, two MOS devices of opposite type, the first one being the load element associated with the second one, between gate and drain of which is connected a crystal wafer, and, on the other hand, a starter device constituted by two other MOS devices, of the same type as the second MOS device, their gates being respectively connected to the drain and to the gate of the second MOS device.

3,753,155
APPARATUS FOR CENTER-REFERENCED PULSE WIDTH MODULATION

Kenneth E. Opal, Oakmont, and Charles R. Kelly, Murrysville, both of Pa., assignors to Power Control Corporation, Pittsburgh, Pa.

Filed Jan. 21, 1972, Ser. No. 219,732
Int. Cl. H03k 7/08
U.S. Cl. 332—9 R 8 Claims

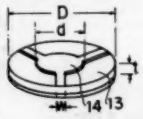


Center-referenced pulse width modulation is accomplished by turning on a bistable element when an initial step sweep signal reaches a voltage reference level during the ON period of an applied gating pulse and turning the bistable element OFF during the OFF period of the gating pulse after a time interval complementary to the ON period of the bistable element preceding the gating pulse center.

3,753,156
WIDE-BAND CIRCULATOR

Taro Miura; Kiichi Nakamura, and Tadashi Hashimoto, all of Tokyo, Japan, assignors to TDK Electronic Company, Ltd., Tokyo, Japan

Filed Aug. 5, 1970, Ser. No. 61,272
Claims priority, application Japan, Sept. 13, 1969, 44/72575
Int. Cl. H01p 5/12, 1/32
U.S. Cl. 333—1.1 7 Claims

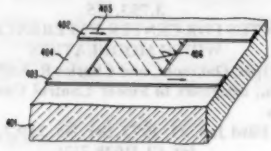


A wide-band circulator for micro-strip line, which utilizes a magnetic member, is described. A circular conductor having integral, radial extensions is disposed on one surface of said magnetic member, the ratio of the diameter of the magnetized region of said magnetic member to the diameter of said circular conductor being in the range between 1.4 : 1 to 2.1 : 1. The wide-band circulator does not need an impedance transformer as was necessary in the circulators of the prior art, so that it can be miniaturieed.

3,753,157
LEAKY WAVE COUPLERS FOR GUIDED ELASTIC WAVE AND GUIDED OPTICAL WAVE DEVICES

Eric A. Ash, London, England, Mark L. Dakss, Yonkers, and Lawrence Kuhn, Ossining, both of N.Y., assignors to International Business Machine Corporation, Armonk, N.Y.

Filed June 30, 1971, Ser. No. 158,237
Int. Cl. H01p 1/10
U.S. Cl. 333—7 R 8 Claims



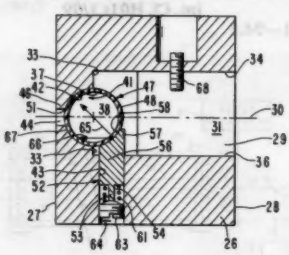
Couplers are disclosed for use with guided elastic waves and guided optical waves. The coupling is effected by means of a coupling region having a different phase velocity characteristic than that of the waveguide. The presence of the coupling region causes the waves traveling in the waveguide to become highly leaky. These leaky waves then encounter a second waveguide or transducer and are coupled into it. Utilizing the electro-acoustic effect in the acoustic wave devices and the electro-optic effect in the optical wave devices, the phase velocity characteristic of the coupling region is controllable, permitting switchable couplers.

3,753,158
MEANS FOR RETAINING GAS-FILLED VIAL IN PRE-TR UNIT

Thomas Gates Prescott, Wenham, Mass., assignor to Varian Associates, Palo Alto, Calif.

Filed June 29, 1972, Ser. No. 267,282
Int. Cl. H01p 1/14
U.S. Cl. 333—13 6 Claims

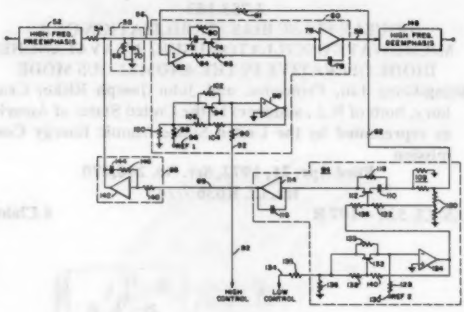
A TR-limiter apparatus includes a pre-TR unit for response to RF energy of a predetermined minimum level. The unit includes a gas-filled vial mounted between a resonant cavity and a slot for coupling RF energy below the predetermined level to the cavity and for reflecting RF energy above the predetermined level. A resiliently biased member urges the gas-filled vial firmly against a retaining surface of a housing to maintain the vial at the inner end of a coupling slot through which the RF energy is supplied. In this manner, the recovery time of the pre-TR unit is minimized and the resonant frequency of the cavity is stabilized despite thermal cycling of the vial and the housing in the operation of the TR-limiter apparatus.



3,753,159
VARIABLE BANDPASS DYNAMIC NOISE FILTER

Richard S. Burwen, 12 Holmes Rd., Lexington, Mass.

Continuation-in-part of Ser. No. 86,398, Nov. 3, 1970, Pat. No. 3,678,416. This application July 26, 1971, Ser. No. 166,197
Int. Cl. H03h 7/12
U.S. Cl. 333—17 17 Claims

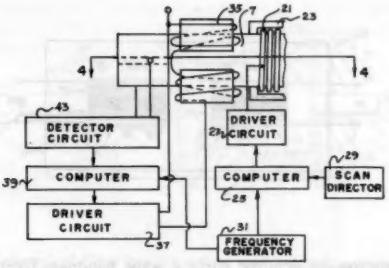


A variable bandpass filter for a dynamic noise filtering effect that reduces the perceptible noise in an audio reproduction system. The variable bandpass filter responds to peak signal levels in relatively high and relatively low frequency portions of the audio spectrum to automatically and independently vary high and low frequency cutoff points for the filter in correspondence with the level of signals at those frequencies. Low distortion and wide dynamic range is achieved in a filter configuration which comprises a forward signal path and a reverse signal path, each having a variable integration response provided by temperature compensated and linearized field-effect transistor circuits. The integration response of the two paths imparts a high and low frequency filtering effect. A further constant gain feedback path establishes a uniform middle frequency amplification for the variable bandpass filter.

3,753,160
RECIPROCAL FERRITE PHASE SHIFTER HAVING MEANS DETECTING DEVIATIONS OF THE ENERGY FROM DESIRED LINEAR POLARIZATION

Paul Safran, St. Louis, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Apr. 20, 1972, Ser. No. 245,847
Int. Cl. H03h 7/16; H01p 1/18
U.S. Cl. 333—17 15 Claims

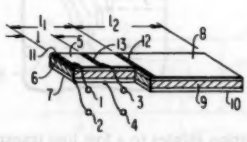


A ferrite phase shifter having a pair of nonreciprocal circular polarizers with a nonreciprocal phase shifter between them, including an electronic control for altering the magnetization of the nonreciprocal circular polarizers. This arrangement may be used to compensate for temperature and power changes and may provide a bandwidth substantially equal to the theoretical for a ferrite loaded waveguide of the same configuration. In the preferred embodiment the waveguide is square, the nonreciprocal circular polarizer (NRCP) is of the transversely magnetized quadrupole field type, and electronically controllable electromagnets at each corner of the NRCP sections provide the required level of magnetization to maintain accurate 90° phase shift of orthogonal vector components of the propagating electromagnetic wave. Also in the preferred embodiment, a linear polarizer at one end of the phase shifter includes a resistive film, and a detector diode is attached to the film to detect deviations of the propagating wave from the desired linear polarization. The detector diode is a part of a control circuit which adjusts the NRCP control magnet settings.

3,753,161
TWO-PORT NETWORK FOR SIGNAL TRANSMISSION CIRCUIT

Takuya Iwakami, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed May 4, 1971, Ser. No. 140,228
Claims priority, application Japan, May 15, 1970, 45/41447
Int. Cl. H04b 3/40
U.S. Cl. 333—23 4 Claims

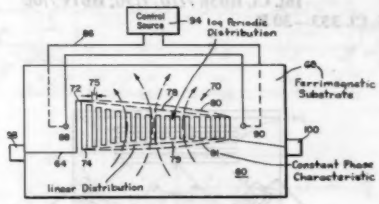


A dummy transmission line having an attenuation characteristic proportional to $\sqrt{f}$ over the frequency band of interest is constructed from two uniformly distributed RC networks. The characteristic impedances of both networks are identical and the length of the second network is determined by the lowest frequency of interest in using the networks.

3,753,162
MICROSTRIP FERRITE PHASE SHIFTERS HAVING TIME SEGMENTS VARYING IN LENGTH IN ACCORDANCE WITH PRESELECTED PHASE SHIFT CHARACTERISTIC

Donald A. Charlton, 21131 Miramar Ln., Huntington Beach, Calif., and William P. Clark, 3934 Greenwood Ave., Orange, Calif.

Filed Sept. 27, 1971, Ser. No. 184,136
Int. Cl. H01p 1/32
U.S. Cl. 333—24.1 3 Claims

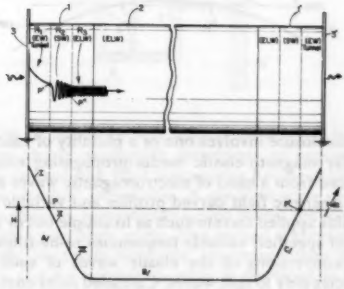


An electronically controllable RF (radio frequency) phase shifter that can be designed to provide either true time delay characteristics or constant phase versus frequency characteristics. The non-reciprocal microstrip phase shifters of the invention utilize a ferrimagnetic substrate with a metallized strip conductor on one face and a metallized ground plane on the other face. The strip conductor has a plurality of adjacent line sections selected to provide a circularly polarized RF magnetic field at a point between each two adjacent conductors with the plane of the circularly polarized magnetic field being orthogonal to the plane of a DC magnetic bias field, the latter plane being provided parallel to the face of the substrate. The circularly polarized RF magnetic field is developed by selecting the line sections with a length so that the signals in adjacent lines are 90° out of phase from each other. When either the level or direction of the DC bias is changed, the permeability of the ferrimagnetic material changes causing a change in the propagation constant and a resultant phase shift change. To provide a relatively wide bandwidth to the phase shifter and a desired delay characteristic, the adjacent conductor sections have their line length varied so that different portions of the line effects the phase shift for different frequencies.

3,753,163
ELECTROMAGNETIC WAVE-ELASTIC WAVE TRANSDUCER AND METHOD

Frederic R. Morgenthaler, Wellesley Hills, Mass., assignor to Chu Associates Inc., Littleton, Mass.

Filed Dec. 27, 1971, Ser. No. 211,976
Int. Cl. H03h 7/30
U.S. Cl. 333-30 R 9 Claims



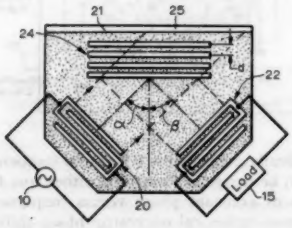
This disclosure is concerned with converting electromagnetic-waves to elastic waves (and vice-versa) in successive re-

gions near an end of a magneto-elastic medium wherein electromagnetic energy tunneling is first forced, spin-wave conversion is then achieved, and finally spin wave-elastic wave conversion is effected such that the elastic waves are propagated in the medium (and vice-versa).

3,753,164
ACOUSTIC SURFACE WAVE FILTER

Adrian J. De Vries, Elmhurst, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Apr. 10, 1972, Ser. No. 242,703
Int. Cl. H03h 7/10, 7/30; H01v 7/00
U.S. Cl. 333—30 R 21 Claims

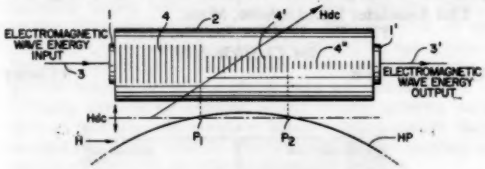


A surface-wave filter has an input transducer for launching acoustic surface waves together with an output transducer that responds to those waves for developing an output signal. The input transducer also is capable of producing undesired bulk waves to which the output transducer may also respond. However, such bulk-wave response is prohibited by a diverter, such as a surface coating that modifies the direction of the surface-wave path relative to that of the bulk waves, so that the output transducer may be oriented to respond only to the desired acoustic surface waves.

3,753,165
TUNABLE VARIABLE BANDWIDTH MAGNETO-ELASTIC FILTER AND METHOD

Frederic R. Morgenthaler, Wellesley Hills, Mass., assignor to Chu Associates Inc., Littleton, Mass.

Filed Dec. 27, 1971, Ser. No. 212,008
Int. Cl. H03h 9/34, 7/08
U.S. Cl. 333—71 19 Claims

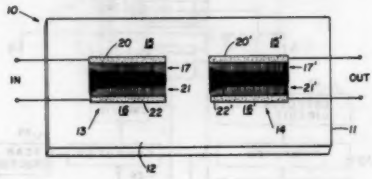


This disclosure involves one or a plurality of cascaded YIG or similar magneto-elastic media propagating elastic waves transduced from a band of electromagnetic waves and having special magnetic field curved profiles and variable bias magnetic fields applied thereto such as to couple out or absorb the energy of specified variable frequencies to-be-filtered, by effecting conversions of the elastic waves of such specified frequencies only to spin waves. Cascaded units enable a bandpass characteristic to be produced that may be varied in width and center frequency.

3,753,166
SURFACE WAVE BANDPASS FILTER WITH NON-LINEAR FM INPUT AND OUTPUT TRANSDUCERS AND DESIGN METHOD THEREFOR

James C. Worley, Sudbury, and Robert Price, Lexington, both of Mass., assignors to Sperry Rand Corporation

Filed Dec. 6, 1971, Ser. No. 204,806
Int. Cl. H03h 7/10, 9/00
U.S. Cl. 333—72 8 Claims



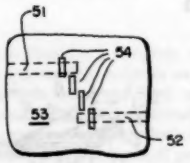
A microwave acoustic surface wave bandpass filter comprises a piezoelectirc substrate with interdigital comb input and output transducers on the surface thereof. The spacing of the interdigital fingers of the input transducer is chosen to be a non-linear function of the distance along the transducer. Thus the input transducer is constructed to possess a non-linear frequency versus time response such that the amplitude versus frequency response thereof is the square root of the desired amplitude versus frequency response of the filter. The output transducer is constructed as a translated image of the input transducer thereby providing the matched filter thereof. The desired amplitude versus frequency characteristic of the filter is the square of the amplitude versus frequency characteristic of either of the transducers.

A method for deriving the non-linear FM function that provides the desired amplitude versus frequency characteristic for the filter is disclosed.

3,753,167
SLOT LINE

Seymour B. Cohn, Tarzana, Calif., assignor to the United States of America as represented by the Secretary of the Army

Division of Ser. No. 826,314, May 21, 1969, Pat. No. 3,688,225. This application May 4, 1972, Ser. No. 250,456
Int. Cl. H03h 7/02, 7/08; H01p 3/08
U.S. Cl. 333—73 R 2 Claims

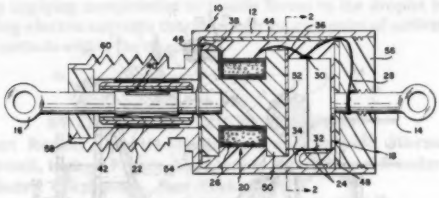


This invention relates to a low loss transmission line having a slotted metal deposited or etched on a high permittivity substrate. With various sizes, shapes and configurations of slots, the transmission line may be used as part of components such as hybrid junctions, couplers, filters, mixers, amplifiers, ferrite devices, and resonators. Novel slot/coax and slot/stripline junctions or connections are disclosed as well as novel methods of slot excitation.

3,753,168
LOW PASS FILTER NETWORK

Ferdinand William Schor, Altadena, Calif., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 9, 1972, Ser. No. 233,121
Int. Cl. H03h 7/04
U.S. Cl. 333—70 S 13 Claims

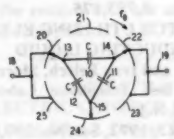


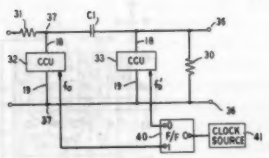
An electrical filter having a first and second terminals extending from opposite ends of a conductive case and a filter network housed within the conductive case. The filter network comprises at least one capacitor connected between the case and the first terminal and an inductive component connected between the first terminal and the second terminal. The filter network further comprises a tubular high frequency filter carried by and connected between the second terminal and the conductive case. The capacitor may extend axially along or transversely across the conductive case and the inductive component may be provided by an inductor or a ferrite bead associated with a terminal member.

3,753,169
BANDPASS FILTER USING PLURAL COMMUTATING CAPACITOR UNITS

Joseph Henry Condon, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 9, 1972, Ser. No. 279,019
Int. Cl. H03h 7/10, 7/16
U.S. Cl. 333—70 A 8 Claims



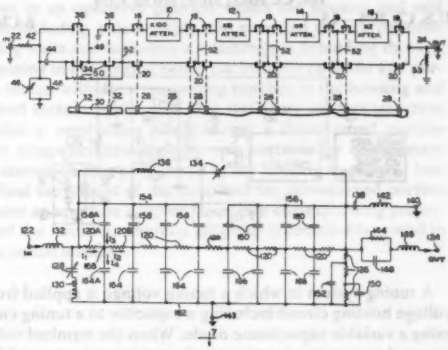


Plural commutating capacitor, 2-terminal, impedance devices are substituted for plural inductance-capacitance circuits in shunt branches of a 3-element π-section bandpass filter. Commutation switch drives for the units are provided at 30 electrical degrees phase difference, but at the same frequency.

3,753,170
STEP ATTENUATOR APPARATUS HAVING ATTENUATOR STAGES SELECTIVELY CONNECTED IN CASCADE BY CAM ACTUATED SWITCHES

Kenneth C. Holland, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Feb. 10, 1971, Ser. No. 114,273
Int. Cl. H01p 1/22
U.S. Cl. 333—81 A 19 Claims

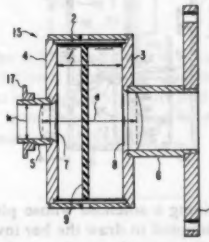


A step attenuator device has a plurality of attenuator stages interconnected via uniform impedance transmission lines. The attenuator stages are switched in a cascade mode of operation using a high frequency contact arrangement permitting high bandwidths. This mode of operation has the advantage of being adapted for use with both high and low impedance circuitry.

3,753,171
COMPOSITE MICROWAVE WINDOW AND WAVEGUIDE TRANSFORM

Robert J. Butwell, San Jose, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Apr. 5, 1971, Ser. No. 131,209
Int. Cl. H01p 1/08, 1/00
U.S. Cl. 333—98 P 5 Claims

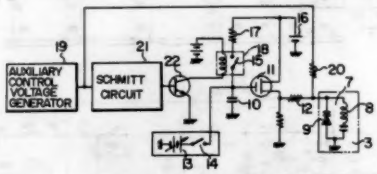


A section of relatively high impedance waveguide is connected via abrupt waveguide transitions at opposite ends thereof to second and third waveguides having substantially lower characteristic impedance. A gas-tight wave permeable window member is hermetically sealed across the center section of high impedance guide. The second waveguide has a substantially lower characteristic impedance than the third waveguide and the window member is displaced in the high impedance guide toward the low impedance guide to form a relatively broad band impedance match, thereby forming the composite window and waveguide transformer structure.

3,753,172
VARACTOR TUNING SYSTEM HAVING MEANS TO MAINTAIN TERMINAL VOLTAGE OF VARACTOR BIASING CAPACITOR WITHIN DESIRED RANGE

Yoichi Sakamoto, Toyanaka, Japan, assignor to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Filed Sept. 11, 1972, Ser. No. 287,919
Claims priority, application Japan, Sept. 14, 1971, 46/71597; Sept. 14, 1971, 46/71598; Sept. 14, 1971, 46/71599
Int. Cl. H03j 5/02; H03b 3/04
U.S. Cl. 334—15 6 Claims

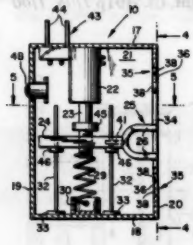


A tuning system in which a tuning voltage is applied from a voltage holding circuit including a capacitor to a tuning circuit using a variable capacitance diode. When the terminal voltage across the capacitor is reduced, the capacitor is charged from a power supply through a switch to compensate the reduction. When the frequency of the tuning circuit is changed to a predetermined extent, the switch is closed to recover the initial level of the voltage of the voltage holding circuit.

3,753,173
ELECTRICALLY REMOTE CONTROLLED DEVICE ATTACHABLE TO SWITCH BOX FACE PLATE FOR ALTERNATELY ACTUATING AND DEACTUATING THE SWITCH

Abraham A. Goldberg, 44 Douglas St., Brentwood, N.Y.

Filed Aug. 11, 1972, Ser. No. 279,926
Int. Cl. H01h 3/02
U.S. Cl. 335—1 15 Claims

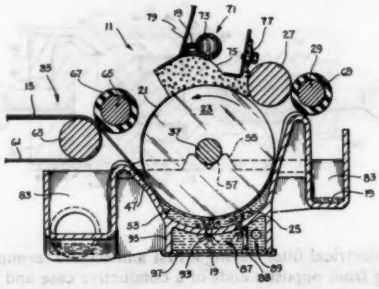


A housing containing a solenoid whose plunger has a bar secured thereto is adapted to draw the bar inward upon energization thereof by, for example, an electric timer. The bar has a yoke on one end slidable in a slot in a wall of the housing. Means is provided for attaching the housing to the face plate of a wall switch box with the pivoted switch lever extending into the yoke. A tension spring normally urges the plunger outward from the solenoid and hence the yoke into a position where it holds the lever in the "off" position. Upon energization of the solenoid by the timer, the yoke swings the switch lever into the "on" position. Stop means are provided to limit the movement of the bar and its yoke between the "off" and "on" positions of the switch lever. The switch may be in circuit with any suitable electrical apparatus or equipment which is to be alternately activated and deactivated.

3,753,174
DEVELOPING UNIT

George J. Miller, Skokie, Ill., assignor to SCM Corporation, New York, N.Y.

Division of Ser. No. 884,393, Dec. 12, 1969, Pat. No. 3,667,987. This application Feb. 16, 1972, Ser. No. 226,568
Int. Cl. G03g 15/10
U.S. Cl. 355—10 10 Claims

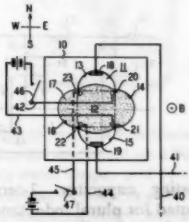


A latent electrostatic image on a surface of a carrier is developed into a visible image by moving the carrier along a developing path with the image-bearing surface contacting a developing liquid in effective field control spacing with an electrically conductive surface of an image intensifier moving along the developing path. Developing liquid is supplied to the surface of the image intensifier by a porous wiper wetted with developing liquid, and an incoming image-bearing carrier is guided along the developing path in contact with the developing liquid by ridges extending along the developing path on an upwardly concave wall which forms a trough through which the image intensifier moves. As the carrier moves through the developing trough, the image-bearing surface is pressed into effective field control spacing with the image intensifier over an elongated distance of the developing path by developing liquid which is received into a chamber and directed against the back side of the carrier by orifices formed in the upwardly concave wall. After passing through the trough, the carrier is guided through a pair of cooperating squeegee rollers which remove excess developing liquid from the carrier.

3,753,175
CROSSPOINT SWITCH UTILIZING ELECTRICALLY CONDUCTING LIQUID

Dean Gillette, Rumson, and Ivan Pelech, Morris Plains, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 13, 1972, Ser. No. 297,498
Int. Cl. H01h 29/04
U.S. Cl. 335—47 11 Claims



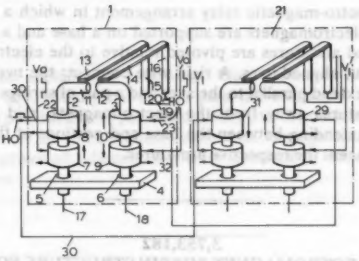
A crosspoint switch includes a housing defining an internal chamber having a central area communicating with four lobes

equally spaced thereabout to form a clover-leaf configuration, and a droplet of electrically conductive non-magnetic liquid which can assume either of two stable positions within the chamber. These positions include the central area and opposite lobes in the North-South or East-West directions. When switched from one stable position to the other, the droplet makes or breaks an electrical connection between one or more pairs of signal leads disposed within the chamber. Switching is accomplished by biasing the entire chamber in a magnetic field perpendicular to its plane and by simultaneously applying compressive or tensile forces to the droplet by passing electric currents therethrough via two pairs of activating contacts within the chamber.

3,753,176
SWITCHING MATRICE CROSSPOINT

Albert Regnier, Issy-les-Moulineaux, and Fernand Silerme, Creteil, both of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 26, 1971, Ser. No. 202,468
Int. Cl. H01h *67/26*
U.S. Cl. 335—112 **12 Claims**

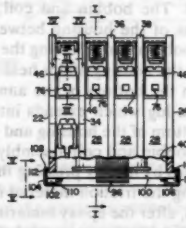


A miniature crosspoint having magnetic latching pairs of contacts is disclosed. Each pair of contacts includes a remanent magnetic conductor serving as a rigid core and a non-remanent magnetic conductive reed. The remanent magnetic conductors are paired with a pole piece to form an inverted U-shaped arrangement. Series fluxes are generated in the cores, and looped through the cores and the pole piece, in contacts not forming a pathway through the crosspoint switch, whereas parallel fluxes are generated in the cores and looped instead through the reeds which are attracted to contact the cores in a selected crosspoint.

3,753,177
ELECTRIC CONTROL DEVICE

Kurt A. Grunert, and John J. Dauer, Jr., both of Beaver, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 31, 1972, Ser. No. 240,061
Int. Cl. H01h *50/04*
U.S. Cl. 335—132 **7 Claims**

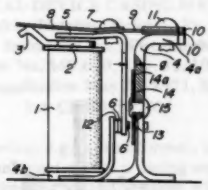


An electric control device or contactor devoid of a mounting bracket and adapted for mounting on a mouting panel and comprising an electrically insulating housing, a stationary contact structure and a movable contact structure within the housing; the device also comprising electromagnetic means for actuating the movable contact carrier structure between opened and closed positions with respect to the stationary contact structure, the movable contact carrier structure also comprising a magnetic coil, an armature, and a magnet; the housing having walls forming an axial opening through which the movable contract structure is inserted or withdrawn from the housing; and means for detachably mounting the assembly of the movable contact structure, armature, the coil, and the magnet in an operative position within the housing and said means including a detachable clip mounted on two opposite housing walls and including a retaining pin extending through an opening in the magnet which pin includes opposite end portions seated within corresponding notches in the housing and retained therein by the clip. The stationary contact structure includes a conducting strap having a downturned portion which strap includes opposite end notches for engagement with corresponding projections in the housing to prevent longitudinal movement of the strap and the downturned portion includes an aperture adapted to receive corresponding projection of the housing, whereby the strap is detachably seated in place on the housing.

3,753,178
RELAY FOR VOLTAGE REGULATOR

Tetsuo Kato, Anjo-shi, Japan, assignor to Nippondenso Co. Ltd., Aichi-ken, Japan

Filed May 31, 1972, Ser. No. 258,107
Claims priority, application Japan, June 3, 1971, 46/38925
Int. Cl. H01h *51/06*
U.S. Cl. 335—135 **7 Claims**



A relay for the voltage regulator in which a setting voltage for voltage regulation is capable of being easily and accurately adjusted without moving the armature and contacts by providing a movable iron piece for effectively changing the gap between the armature and the yoke.

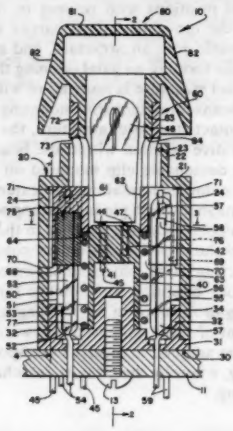
3,753,179
REED SWITCH

Emil R. C. Straub, Cozad, Nebr., assignor to Vectronix, Inc., Cozad, Nebr.

Filed May 18, 1972, Ser. No. 254,724
Int. Cl. H01h *13/14*
U.S. Cl. 335—207 **21 Claims**

A plunger is slidably mounted in a housing so as to move along a predetermined path. A pair of laterally spaced apart magnets is operatively engaged by the plunger so as to be movable parallel to the predetermined path. A pair of magnetically-responsive contacts is disposed between the paths of

the magnets, which contacts are switched from one condition to the other in response to movement of the magnets in one



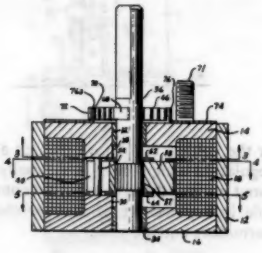
direction and is then switched back to the original condition by movement of the magnets in the other direction.

3,753,180

ROTARY SOLENOID

William F. Sommer, Brookville, Ohio, assignor to Ledex Inc., Dayton, Ohio

Filed May 23, 1972, Ser. No. 256,173
Int. Cl. H01f 7/14
U.S. Cl. 335—272 9 Claims



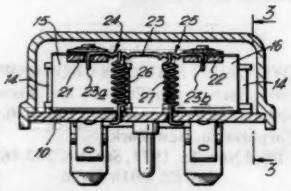
A rotary solenoid comprises a ferromagnetic core assembly flux linked to an electromagnetic coil. The core assembly comprises confronting pole pieces having flat face portions spaced apart to define an air gap. The rotary solenoid includes a rotary assembly comprising a shaft adjacent said pole pieces journalled to said core assembly for rotation about an axis perpendicular to said pole faces. The rotary assembly includes an armature plate fixed to said shaft and projecting outwardly from said shaft for entry into said air gap. The rotary solenoid includes non-magnetic spacer members, one disposed on each side of said armature plate, said spacer members sized with said aramture plate for a close fit between said pole faces, said spacer members cooperating with said pole faces to restrain said rotary assembly against axial movements.

3,753,181

ELECTRO-MAGNETIC RELAY ARRANGEMENT

Derek Thornley, Nelson, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Mar. 1, 1972, Ser. No. 230,625
Claims priority, application Great Britain, Mar. 5, 1971, 6,209/71
Int. Cl. H01f 7/08
U.S. Cl. 335—274 5 Claims



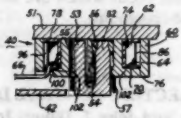
An electro-magnetic relay arrangement in which a pair of spaced electromagnets are supported on a base and a pair of associated armatures are pivoted relative to the electro-magnets about aligned axes. A rigid wire connects the two armatures to extend parallel to the axes and a pair of springs biasses the armatures away from the electro-magnets, said pair of springs extending between the base and portions of the rigid wire adjacent the respective armatures.

3,753,182

ELECTROMAGNET BOBBIN STRUCTURE FOR VEHICLE BRAKES CONTAINING AN ABRASIVE WEAR SURFACE

Leroy K. Grove, 512 S. Merrifield Ave., Mishawaka, Ind.

Filed Nov. 10, 1971, Ser. No. 197,329
Int. Cl. H01f 7/08
U.S. Cl. 335—281 14 Claims



An electromagnet for use in electric vehicle brakes in which a bobbin for the electrical coil contains a flange of a friction material which engages the armature of the brake when the magnet is energized. The bobbin and coil assembly are inserted in the annulus of the housing between the inner and outer poles and the bobbin flange having the friction materials forms a snug fit with the housing and is held firmly in place by an epoxy material in the bottom of the annulus. The bobbin preferably contains a lug which extends into and/or through an opening in the bottom of the housing and protects the leads from the coil. The bobbin and coil assembly can be easily assembled in the annulus by merely pressing the bobbin in place with the flange having the friction material flush with the surface of the two poles, after the epoxy material has been placed in the annulus, thus providing an accurately faced electromagnet after the coil has been assembled therein without machining or grinding.

3,753,183

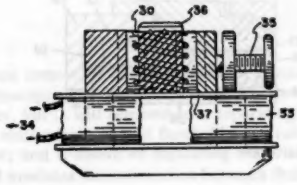
METHOD OF FORMING A MAGNETIZED HELICAL COIL

Ronald A. Aspinwall, Detroit, and MacKellar K. Graham, Birmingham, both of Mich., assignors to Sperry Rand Corporation, Troy, Mich.

Continuation of Ser. No. 59,773, June 23, 1970, abandoned, which is a continuation of Ser. No. 855,693, Sept. 5, 1969, Pat. No. 3,598,237. This application June 21, 1972, Ser. No. 264,823

Int. Cl. H01f 13/00

U.S. Cl. 335—284 3 Claims



A filter including a cylindrical filter element which is arranged to normally have fluid pass therethrough. A bypass valve is provided to bypass fluid directly to the outlet when the pressure at the inlet becomes excessive. A magnetized helical coil is provided adjacent the filter element to attract metal particles.

3,753,184

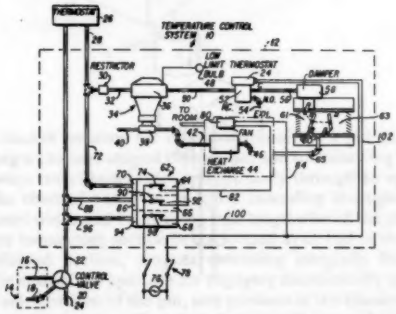
TEMPERATURE CONTROL SYSTEM

Thomas M. Holloway, Waukesha, and Robert G. Weeks, Milwaukee, both of Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Filed Mar. 23, 1972, Ser. No. 237,371

Int. Cl. F24f 7/06

U.S. Cl. 236—47 9 Claims



A temperature control system which utilizes a two-level pneumatic pressure source and a control valve operative to selectively subject the control system to either of the two pressure levels or to a pulse of decreased pressure to effect normal night temperature, warm-up period temperature, and normal day temperature modes of operation.

3,753,185

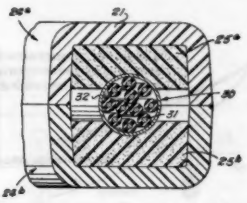
METAL DETECTOR SEARCH COIL

William A. Mahan, P.O. Box 451, Dallas, Tex.

Filed Dec. 5, 1972, Ser. No. 312,286

Int. Cl. H01f 15/04, 27/02

U.S. Cl. 336—84 11 Claims



A device for detecting metal articles buried beneath the surface for example, includes a search coil at one end of a handle, with the handle carrying the detector circuit components. The search coil is an induction coil enclosed within an annular chamber formed from a plastic housing having the form of a spoked wheel for example, and which is formed from two mating housing halves joined in the plane of the coil chamber. The coil is made up of a number of turns of insulated wire wherein the insulation material has a low coefficient of thermal expansion, with the coil being sheathed in metal foil to provide a Faraday shield. The coil is supported within the housing annular chamber on pads of foam rubber-like material which yieldingly supports and restrains the coil within the housing annular chamber.

3,753,186

ELECTRICAL DEVICE CASING MATERIALS

George P. Seitanakis, Natrona Heights, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 849,610, Aug. 11, 1969, Pat. No. 3,629,760. This application May 20, 1971, Ser. No. 145,561

Int. Cl. H01f 27/02

U.S. Cl. 336—90 2 Claims

An electrical device; e.g., a transformer, with a fluctuating magnetic field, contained within a casing comprised of steel which has a resistivity in excess of about 65 microhm-cm at room temperature and which is substantially nonmagnetic after a cold reduction of up to 65 percent. The steel consists essentially of 0.15–1.1% C, 20–40% Mn, 7–16% Al, up to 10% Ni, balance Fe and incidental impurities.

3,753,187

ELECTRICAL DEVICE CASING MATERIALS

George P. Seitanakis, Natrona Heights, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 849,610, Aug. 11, 1969, Pat. No. 3,629,760. This application May 20, 1971, Ser. No. 145,484

Int. Cl. H01f 27/02

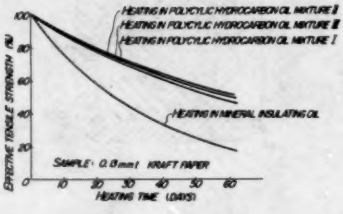
U.S. Cl. 336—90 1 Claim

An electrical device; e.g., a transformer, with a fluctuating magnetic field, contained within a casing comprised of steel which has a resistivity in excess of about 65 microhm-cm at room temperature and which is substantially nonmagnetic after a cold reduction of up to 65 percent. The steel consists essentially of up to 0.08% C, up to 2% Mn, up to 1.00% Si, 16.0 – 18.0% Cr, 10.0 – 14.0% Ni, 2.0 – 3.0% Mo, balance Fe and incidental impurities.

3,753,188
INDUCTIVE ELECTRIC APPARATUS

Akira Miyoshi; Tomio Nagaoka; Hasaaki Takahashi, and Kensuke Okuda, all of Tokyo, Japan, assignors to Hitachi, Ltd. and Kureka Industry Co., both of Tokyo, Japan

Filed Dec. 28, 1970, Ser. No. 101,686
Claims priority, application Japan, Dec. 29, 1969, 44/1120
Int. Cl. H01f 27/02
U.S. Cl. 336—94 7 Claims

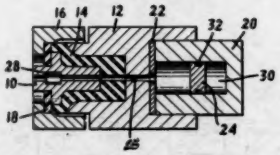

HEATING IN POLYCYCLIC HYDROCARBON OIL MIXTURE II
HEATING IN POLYCYCLIC HYDROCARBON OIL MIXTURE III
HEATING IN POLYCYCLIC HYDROCARBON OIL MIXTURE I
HEATING IN MINERAL INSULATING OIL
SAMPLE: 0.8mm t KRAFT PAPER
DIELECTRIC TENSILE STRENGTH (%)
HEATING TIME (DAYS)

An inductive electric apparatus which comprises a polycylic hydrocarbon oil mixture having a flash point of more than 150°C and consisting of polycyclic naphtenic hydrocarbons having two to five rings and polycyclic aromatic hydrocarbons having two to four rings, each side chain alkyl group attached to said rings having not more than four carbon atoms, an electroconductive coil and a cellulose insulator in combination. The inductive electric apparatus can have a larger increase in allowable temperature than that of a combination of the ordinary hydrocarbon insulating oil and the cellulose insulator, and accordingly it is possible to make the apparatus smaller and lighter.

3,753,190
CURRENT LIMITING DEVICE

Toshio Ito; Toshio Miyamoto; Yuichi Wada, and Teijiro Mori, all of City of Amagasaki, Hyogo Prefecture, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed June 9, 1970, Ser. No. 44,785
Claims priority, application Japan, June 10, 1969, 44/45589; Nov. 1, 1969, 44/87749
Int. Cl. H01h 87/00
U.S. Cl. 337—21 3 Claims

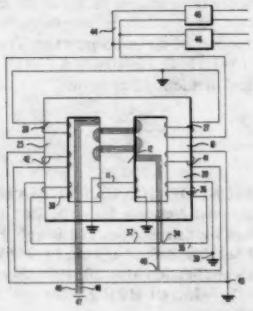


Two electrodes are interconnected in spaced opposed relationship through an electric insulation through which a current limiting material of a self-restoring type extends to normally electrically interconnect both electrodes. The insulation is equal to or higher than the current limiting material in thermal conductivity. Alternatively the current limiting material is partly reduced in cross section and coupled to a pressure relief element. The reduced portion of the current limiting material may be encircled with a material higher in electric resistivity than the limiting material and good in arc-proof property.

3,753,189
COMBINED ISOLATING AND NEUTRALIZING TRANSFORMER

Gordon Y. R. Allen, 4 Ireland Ct., Islington, Ontario, Canada

Filed Mar. 3, 1972, Ser. No. 231,660
Int. Cl. H01f 27/28
U.S. Cl. 336—171 7 Claims

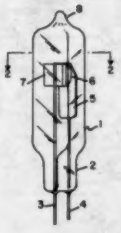


A neutralizing transformer in which the communication frequency input cable comprising one or more twisted pairs of wires has each wire of a twisted pair wound on opposite outer legs of the core of the transformer. A similar pair of isolating windings is wound on the same outer legs.

3,753,191
LOW PROFILE GLASS ENCLOSED HERMETICALLY SEALED CIRCUIT BREAKER

Philip J. Dennis, Cape Elizabeth, Maine, assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Mar. 20, 1972, Ser. No. 235,903
Int. Cl. H01h 45/02
U.S. Cl. 337—112 3 Claims

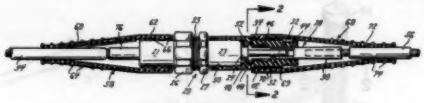


A circuit breaker comprises a bimetal snap-action element disposed within a hermetically sealed glass envelope. The snap-action element opens an electrical circuit upon thermal or current overload. The glass envelope has two substantially flat parallel sides in order to provide a low profile to the circuit breaker and to improve thermal transfer to the snap-action element.

3,753,192
PROTECTOR FOR ELECTRIC CIRCUITS

Angelo Urani, St. Louis, Mo., assignor to McGraw-Edison Company, Elgin, Ill.

Continuation of Ser. No. 871,233, Nov. 3, 1969, which is a division of Ser. No. 796,520, Feb. 4, 1969, Pat. No. 3,518,600. This application Nov. 22, 1971, Ser. No. 200,711
Int. Cl. H01h *85/02*
U.S. Cl. 337—201 4 Claims

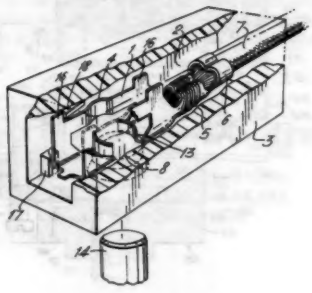


A female connector is connected to a conductor and normally telescopes over a male connector on one end of a fuseholder, but is will respond to a separating force, smaller than the elastic limit of that fuseholder, to release that male connector; and a sleeve of insulating material normally encases and insulates the connection between that male connector and that female connector.

3,753,193
SOCKET TERMINAL

Wladimiro Teagno, and Luigi Campari, both of Turin, Italy, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 17, 1972, Ser. No. 244,744
Claims priority, application Italy, Apr. 27, 1971, 23731 A/71
Int. Cl. H01r *11/22*
U.S. Cl. 339—256 R 3 Claims



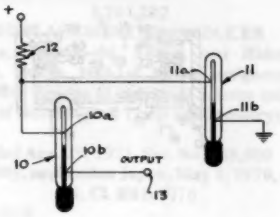
A socket terminal for releasably receiving a pin and comprising a channel-shaped contact portion for receiving the pin between the channel sides and normally through an aperture in the channel base, the aperture extending throughout the channel width and being elongated lengthwise of the channel; a wire connecting section being formed at an end of the channel-shaped portion, tongues extending integrally from opposite ends of the aperture for engaging diametrically opposite first side portions of the pin, side portions of the channel being arranged to engage diametrically opposite second side portions of the pin orthogonally arranged with respect to the first side portions.

The socket terminals are particularly useful when assembled in cluster blocks of the kind used in connecting through the hermetically sealed enclosures of refrigerator motors where they may be subject to vibration and adverse atmospheric environment but must satisfy stringent reliability requirements.

3,753,194
TEMPERATURE DIFFERENTIAL MONITOR

Carl Krisco, Oak Park, Ill., assignor to V.A.C. Industries

Filed July 26, 1972, Ser. No. 275,275
Int. Cl. H01h *29/30*
U.S. Cl. 337—331 4 Claims

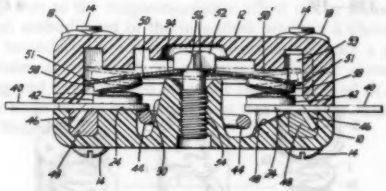


A thermal switch including first and second electroconductive column type thermostats at different preset temperature settings and a current limiting resistor, all interconnected together, wherein an output voltage is available between the two preset temperature settings of the thermostats.

3,753,195
THERMOSTATIC SWITCH

Lee O. Woods, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Sept. 20, 1972, Ser. No. 290,570
Int. Cl. H01h *37/20*
U.S. Cl. 337—347 10 Claims

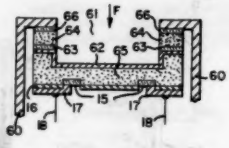


A thermostatic switch is disclosed comprising a dielectric housing having a first switch contact mounted within the housing. A thermoresponsive element having a central aperture is provided with a second switch contact mounted to the thermoresponsive element to make and break with the first switch contact upon actuation of the thermoresponsive element. A screw is screwed into the housing with a screw head disposed above an interior surface of the housing and a screw shank passing through the thermoresponsive element central aperture between the screw head and the housing interior surface. The central portion of the thermoresponsive element about the aperture is free to move along the screw shank between the screw head and housing interior surface. With this arrangement the screw provides means for adjusting the disposition of the thermoresponsive element while the screw head and housing interior surface limit movement of the central portion of the thermoresponsive element.

3,753,196
TRANSDUCERS EMPLOYING INTEGRAL PROTECTIVE COATINGS AND SUPPORTS

Anthony D. Kurtz, Englewood; Charles L. Cravel, Riveredge, and Joseph R. Mallon, Jr., Wood-Ridge, all of N.J., assignors to Kulite Semiconductor Products, Inc., Ridgefield, N.J.

Filed Oct. 5, 1971, Ser. No. 186,694
Int. Cl. G01l 1/22
U.S. Cl. 338—4 7 Claims

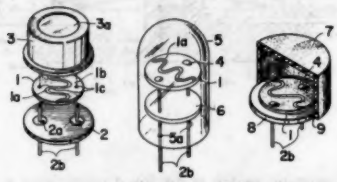


There is disclosed a force transducer fabricated from silicon and having the appearance of an annular disk. Disposed on one surface of said disk are one or more piezoresistive elements which respond to a force applied to a diaphragm portion of said disk which is surrounded by the wall formed by the annular ring. The disk is mounted in a housing with the piezoresistive elements facing away from the applied force surface; this surface of the diaphragm and ring has formed thereon a thin layer of silicon dioxide which serves to protect the disk against deleterious agents present in the force transmitting environment while further serving to eliminate an undesirable bimetallic effect.

3,753,197
PHOTOCONDUCTIVE CELL

Norifumi Tachihara, Tokyo, and Hiroshi Yamaguchi, Tokorozawa, both of Japan, assignors to Kabushiki Kaisha Koparu, Tokyo, Japan

Filed July 14, 1971, Ser. No. 162,560
Claims priority, application Japan, July 20, 1970, 45/63418
Int. Cl. H01c 7/08
U.S. Cl. 338—19 4 Claims

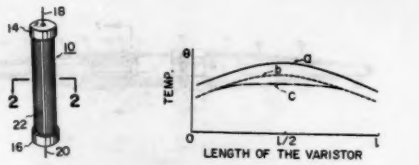


A photoconductive cell comprising an electrically insulated base plate carrying, on one surface, a light-sensitive substance capable of varying its resistance value with the intensity of the light incident thereto and also a conductive substance electrically connected with the light-sensitive substance, terminals connected to the conductive substance, and two sheets of electrically insulated transparent or translucent films bonded tightly to each other forming a sealed envelope sandwiching both the base plate and the terminals between the two films. The sealing of these films is accomplished either by the use of a bonding agent, or by relying on the heat-sealing method, the high frequency wave sealing method or the ultrasonic wave sealing method. Thus, very thin photoconductive cell can be manufactured easily on mass production basis at low cost.

3,753,198
VARISTORS

Masao Shimizu, Suginami-ku, Tokyo, Japan, assignor to Denki Onkyo Company, Limited, Tokyo, Japan

Filed Sept. 18, 1970, Ser. No. 73,390
Claims priority, application Japan, Sept. 19, 1969, 44/88857; Sept. 19, 1969, 44/88858
Int. Cl. H01c 7/10
U.S. Cl. 338—20 2 Claims



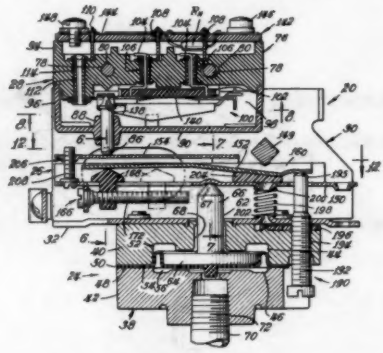
A plurality of heat radiating axial ribs are provided on the surface of a varistor.

For a varistor in the form of a hollow cylinder, such ribs are formed on both or either one of the inner and outer surfaces of the varistor.

3,753,199
PRESSURE-TO-ELECTRIC TRANSDUCER

Paul Patrick Rice, R.R. No. 3, Box 411, Elkhart, Ind.

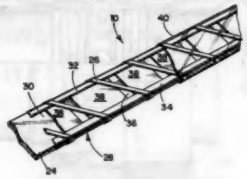
Filed Feb. 24, 1972, Ser. No. 229,123
Int. Cl. H01c 13/00
U.S. Cl. 338—42 17 Claims



A transducer for providing an electrical output voltage linearly proportional to an input pressure is assembled on a frame having a bottom wall and a pair of sidewalls. A pressure diaphragm housing is supported below the bottom wall of the frame and includes a central passageway and an intersecting cavity. A diaphragm member is disposed across said cavity crosswise to the central passageway to define an expandable and collapsible pressure chamber with the lower portion of the cavity. A force transfer member is slidably supported in the upper portion of the central passageway with its lower end abutting against the diaphragm member and its upper end extending above said bottom wall. A pivot member extends between the frame sidewalls and a main lever is supported between the pivot member and the upper end of the force transfer member with a spring means constantly urging the lever towards the force transfer member. Variable resistance means are actuated by the arcuate movement of the main lever to provide an electrical output signal directly propor-

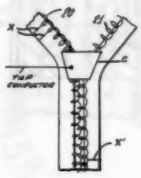
tional to the displacement of the force transfer member in response to changes in the pressure in the pressure chamber.

3,753,200
SHORT CIRCUIT PROOF LEVEL SENSOR
John Niejadlik, Littleton, Mass., assignor to Meritape, Inc., West Concorde, Mass.
Filed May 18, 1972, Ser. No. 254,484
Int. Cl. G01f *23/18*
U.S. Cl. 338—42 **7 Claims**



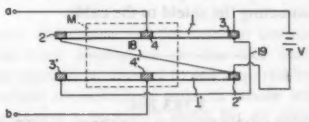
An elongated continuous sensor adapted for disposition within a fluent material for monitoring the level thereof and operative even in the presence of a short circuit in the electrical winding of such sensor. A resistance winding helically wound around and insulated from a base strip includes portions confronting a surface having discrete conductive areas, each adjacent pair of areas being bridged by a respective turn of the helical winding. In the presence of surrounding pressure caused by the fluent material mass, the bridging turns within the material mass are deflected into engagement with the underlying conductive areas such that the discrete conductive areas within the material mass are effectively interconnected to short circuit that portion of the snesor submerged within the mass, the resistance of the helical winding above the material mass being a direct measure of material level. A short circuit of one or more adjacent turns of the helical winding to the underlying conductive areas causes the short circuiting of only those turns with the result that the sensor remains operative with only a slight error introduced by the number of turns short circuited.

3,753,201
VARIABLE RESISTANCES FOR AN ELECTRICAL CIRCUIT
Leo S. Ohman, 1635 Garden Ave., St. Paul, Minn.
Filed Oct. 29, 1970, Ser. No. 85,081
Int. Cl. H01c *5/00*, *13/00*
U.S. Cl. 338—92 **3 Claims**



Apparatus for predeterminately and progressively interconnecting input and output conductors of a multiplicity of supply lines for fluid or electrical sources utilizes a slide fastener or coupling system which utilizes a pair of opposed strip flexible sections carrying adjacent to their opposed longitudinal edges, cooperating interconnecting media. One or more slide members slidable longitudinally of said strips progressively engage portions of said opposed interconnecting media to interlock the same progressively drawing said opposing edges closely together and in so doing, when slidably applied in one direction, to interconnect predetermined pairs of spaced conductors attached to said strip and having each in communication with an electrical or fluid source whereby when said slide member is actuated in one direction interconnection of predetermined pairs of conductors is effected and when said slide element is actuated in the opposite direction all of said sets of conductors become disconnected.

3,753,202
DISPLACEMENT TRANSDUCER
Shoei Kataoka, Tanashi-shi, Tokyo, and Hideo Yamada, Setagaya-ku, Tokyo, both of Japan, assignors to Kogyo Gijutsuin (a/k/a Agency of Industrial Science and Technology Ministry of International Trade and Industry), Tokyo-To, Japan
Filed Apr. 29, 1971, Ser. No. 138,508
Claims priority, application Japan, May 1, 1970, 45/37446
Int. Cl. H01c *7/16*
U.S. Cl. 338—32 H **10 Claims**



A displacement transducer is comprised of an magnetoresistive element, or an elongated semiconductor member having the magnetoresistive effect. A pair of electrodes are affixed at both ends of this magnetoresistive element, and a third electrode at the center. While an electric current is made to flow therethrough from each of the pair of electrodes to the third electrode, an applied magnetic field is moved thereon toward either side of the third electrode to obtain an output voltage due to the magnetoresistive effect of the element. In another embodiment of the invention, wherein a plurality of metal boundaries are formed at intervals between a pair of electrodes at both ends of an magnetoresistive element, a leading end of an applied magnetic field is inclined to such a degree as to extend between at least two adjoining ones of the metal boundaries.

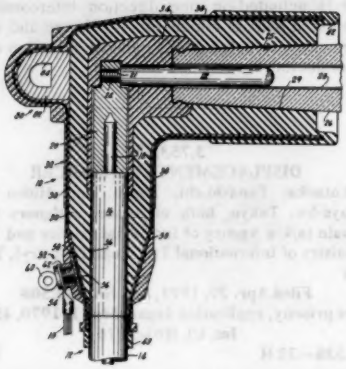
ERRATUM

For Class 339—256 R see:
Patent No. 3,753,193

3,753,203
SHIELDED HIGH VOLTAGE CONNECTOR
Edwin A. Link, Waukesha, Wis., assignor to RTE Corporation, Waukesha, Wis.
Filed June 30, 1971, Ser. No. 158,159
Int. Cl. H01r *3/06*
U.S. Cl. 339—14 L **4 Claims**

A shielded electrical connector for a high voltage cable having a section of the cable insulation removed to expose a conductor, the connector including an electrically insulating member surrounding the cable insulation and conductor, and an electrically conductive shield surrounding said insulating member. The conductive shield is formed from a layer of elec-

trically conductive material and a metallic mesh, the shield being bonded to the outer surface of the insulating member. A



disconnect assembly can be provided for selectively connecting and disconnecting the shield to the cable.

3,753,204

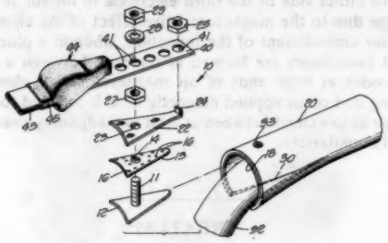
SOLDERLESS CONNECTOR ASSEMBLY FOR CABLE SHIELDING JACKETS AND METHOD OF INSTALLING THE SAME

John T. Thompson, 244 Loring St., Los Angeles, Calif., and George W. Gillemot, 2231 20th St., Santa Monica, Calif.

Continuation of Ser. No. 12,820, Feb. 2, 1970. This application Dec. 27, 1971, Ser. No. 212,399

Int. Cl. H01r *13/50, 3/06*

U.S. Cl. 339—14 R **31 Claims**



A connector assembly and method of making a strong mechanical, solderless, electrical connection to the thin shielding jacket underlying a cable sheath. When employed in combination with a tension strip the connector assembly provides both a grounding connection for the shield and a load transmitting member for the major load forces acting lengthwise of the cable. The connector assembly includes a threaded fastener inserted through aligned holes in the shield and sheath and is employed to clamp the shield and sheath between a pair of wide area shoes with the inner one pressed into firm contact with the shield. Similar connector assemblies anchored to the cable shield and sheath to either side of a splice zone are interconnected by an insulated conductive tension strip to interconnect the two shields and to transfer load forces across the splice zone.

3,753,205

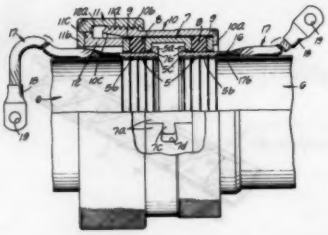
COUPLER DEVICE FOR TUBING ENDS PROVIDING MECHANICAL AND ELECTRICAL CONNECTIONS THEREWITH

William H. Tuger, Huntington Beach, Calif., assignor to E. B. Wiggins, Inc., Los Angeles, Calif.

Filed June 7, 1971, Ser. No. 150,353

Int. Cl. H01r *3/04*

U.S. Cl. 339—15 **3 Claims**



A unique coupler device for effecting mechanical and electrical connections with the coupled ends of fluid conducting tubing, which utilizes a flanged ferrule swaged to each coupled end of the tubing, with the ferrules in each case serving the double purpose of a mechanical connecting component of the coupler, and a permanent securement component for anchoring one end of an electric conductor cable to the tubing end to provide an electrical connection with the tubing.

3,753,206

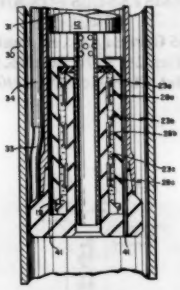
ELECTRICAL CONNECTOR WITH COAXIAL CONTACTS

Henry L. Busuttil, Chatsworth; Sol S. Kreisler, Downey; James R. McGibbeny, Marina Del Rey, and Russell O. Pearson, Redondo Beach, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Dec. 9, 1971, Ser. No. 206,284

Int. Cl. H01r *3/04*

U.S. Cl. 339—16 C **16 Claims**



An electrical connector especially suitable for subsea and oil well applications is disclosed. One member of the connector is movably associated with submergible equipment and as described for oil well applications includes a cylindrical shell with a center post depending within the shell permissive of acting as an alignment guide and a flow passage. The other member of the connector is permanently positioned subsurface on a subsea structure or within an oil well production tubing where it receives the one member. A tubular member carries a number of ring contacts that engage tubular contacts in the first member. To purge hostile fluids, a viscous dielectric

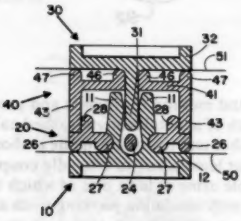
grease is packed in the shell of the movable member and is partially expelled as the connector members are engaged. The configuration is particularly permissive of removing a downhole oil well pump without reeling in an electrical cable and of thereafter passing servicing tools through the subsurface member.

3,753,207

CONNECTOR FOR THE ELECTRICAL CONNECTION OF FLEXIBLE CONDUCTORS

Peter Francis Maheux, Kanata, and Robert Maarten Van Dyk, Dunrobin, Ontario, both of Canada, assignors to Bell Canada - Northern Electric Research Limited, Ottawa, Ontario, Canada

Filed Oct. 7, 1971, Ser. No. 187,385
Int. Cl. H05k *1/02*
U.S. Cl. 339—17 F **3 Claims**



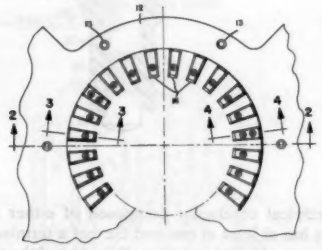
A connector for and method of connecting a flexible conductor, such as a flat flexible cable or flexible circuits, in which the flexible conductor is flexed over at least one rib, the conductor held in position over the rib by a retaining member. In a particular example, a first conductor is flexed over a single rib while a second conductor is flexed over and down between two parallel ribs, both conductors held in place by retaining members. The first conductor and its supporting rib is then inserted between the parallel ribs and the two conductors are electrically connected.

3,753,208

VARIABLE LENGTH ROTOR APPARATUS

Philip J. Bochicchio, Ellicott City, Md., assignor to the United States of America as represented by the Secretary of the Army

Filed Dec. 17, 1970, Ser. No. 97,449
Int. Cl. H01r *25/00*
U.S. Cl. 339—18 P **4 Claims**



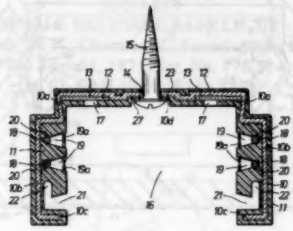
A variable length rotor apparatus, including a rotor body having a plurality of insertable segments arranged around the periphery of the rotor body, the number of the segments being selected to coincide with the number of contacts desired, giving the rotor a variable length capability. The segments are held in position in the rotor by clamping rings, each segment having pin connections which enable it to function as a separate contact in the rotor body. Associated with the rotor body structure are appropriate stator body sections embodying the same principles.

3,753,209

CURRENT DISTRIBUTOR RAIL

Kurt Hesse, Lemgo-Lippe, Germany, assignor to Staff & Schwarz GmbH, Lemgo-Lippe, Germany

Filed Jan. 5, 1971, Ser. No. 104,105
Int. Cl. H01r *13/60*
U.S. Cl. 339—21 R **8 Claims**



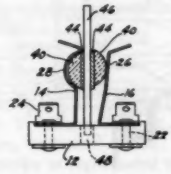
A current distributor rail for current consumers such as lamps, electrical appliances or the like including a rail member adapted to be severed to any required length and having a constant cross-section over its whole length, the rail member defining a receiving space for an adapter which is open at one end of the rail member, the receiving space having two opposite fixing grooves extending over the whole length of the rail for adapter mounting, at least two oppositely located electric conductors extending over the whole length of the rail and, at least one earthing conductor the earthing conductor being accessible for tapping current from the receiving space and a cover means located at each end face of the rail member and covering the conductors to make them inaccessible.

3,753,210

ELECTRICAL CONNECTOR AND MOUNTING MEANS FOR CERAMIC GLOW IGNITERS

Hugo H. Speth, St. Louis, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Sept. 20, 1971, Ser. No. 181,894
Int. Cl. H01r *13/20, 13/64, 13/20, 13/64*
U.S. Cl. 339—65 **2 Claims**

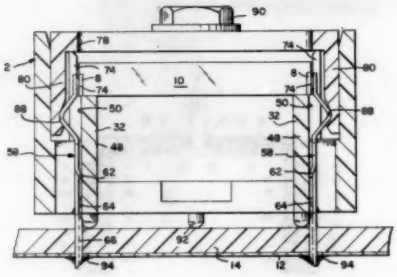


A spring clip connector and mounting device for a ceramic glow igniter including a pair of spaced, upstanding, resilient, conductive legs engaging the opposite arcuate surfaces of adjacent and connected semicylindrical end portions of a ceramic loop, one leg being arcuate and the other straight so that they may receive between them and securely support and electrically connect an igniter in which the connected semicylindrical end portions thereof are misaligned.

3,753,211
CONNECTING MEANS FOR CERAMIC SUBSTRATE PACKAGE

William Vito Pauza, Palmyra, Pa., and John Franklin Smith, III, Menlo Park, Calif., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 6, 1971, Ser. No. 186,876
Int. Cl. H01r *13/54*
U.S. Cl. 339—75 MP 8 Claims

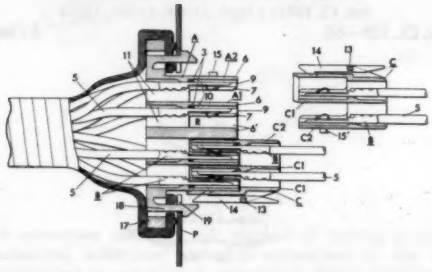


Multi-contact connector for ceramic substrate integrated circuit assembly comprises a housing, adapted to receive the substrate, and a cover member. The housing contains two rows of contact terminals and supporting surface portions for supporting the substrate between the two rows of terminals. The cover member, when assembled to the housing, causes the contact portions of the terminals to move to and fro across the terminal pads on the substrate thereby to achieve a wiping action at the electrical interface.

3,753,212
MULTI-TERMINAL CONNECTOR ASSEMBLY

Shoji Yamada, and Yoshiaki Kawaguchi, both of Gotenba, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Jan. 20, 1971, Ser. No. 107,934
Claims priority, application Japan, Jan. 21, 1970, 45/006110 (utility model); Jan. 26, 1970, 45/007386 (utility model)
Int. Cl. H01r *13/54*; H02b *1/02*
U.S. Cl. 339—91 R 11 Claims

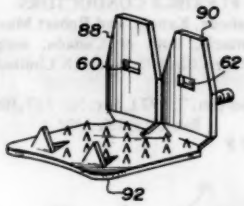


A multi-terminal connector assembly which comprises a panel connector element including a plurality of blocks with a desired number of terminal plates; an attachable connector element corresponding to each of said blocks; said panel connector being provided with a flange adapted to be fitted to an intercepting wall around its opening; thereby systematically connecting wiring harnesses on the both sides of said wall. Such a multi-terminal connector assembly can be simply and air-tightly attached to an intercepting wall such as a dash panel of a motor-car, and effectively shut off poisonous gases, noises etc.

3,753,213
METHOD AND MEANS FOR CONNECTING TO A METALLICALLY SHEATHED CABLE

William G. Frey, Union, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Jan. 7, 1972, Ser. No. 216,192
Int. Cl. H01r *11/20*
U.S. Cl. 339—97 R 1 Claim

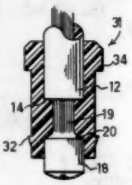


A connector and method for rapidly and conveniently connecting the sheath of a metallically sheathed cable to a further conductive member and including in one embodiment, a body member having at least a pair of hingedly coupled, superpositionally disposable arms at least one of which is provided, on its interior face, with insulation piercing teeth and at least one elongate member serving as a locking tab, and the other of which is provided with a mating tab receiving aperture to facilitate the interlocking of said arms, and coupling means preferably for attaching the connector to a conductive strap or lead. The connector may be integrally formed to provide a unitary foldable cliplike structure readily securable about a selectively exposed portion of the metallic cable sheath. The coupling means may include a threaded extension, deformable projections, or apertured tongue formed integrally with, or suitably attached to, the connector body member.

3,753,214
ELECTRICAL CONDUCTORS

Gideon A. DuRocher, and Ellsworth S. Miller, both of Mt. Clemens, Mich., assignors to Essex International Inc., Detroit, Mich.

Filed June 1, 1971, Ser. No. 148,786
Int. Cl. H01r *13/58*
U.S. Cl. 339—102 R 8 Claims



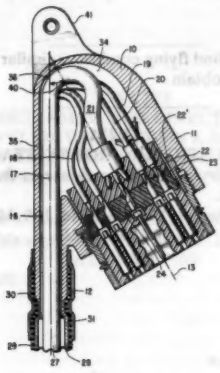
An electrical conductor composed of either stranded or solid wire has at least at one end thereof a terminal the cross-sectional area of which is greater than that of the wire, the terminal constituting an integral part of the wire and being formed by axial and lateral deformation of the wire end. The terminal may be formed either by spinning or swaging, or both simultaneously, the wire end in a die having a forming chamber into which a swaging or spinning member may be thrust so as to deform the free end of the wire both axially and radially. The terminal and the adjacent portion of the wire are surrounded by an insulating sleeve adapted for insertion in an

opening formed in a connector body in such manner that the terminal is exposed for electrical connection to another conductor which may be supported in another connector body. A compressible, elastomeric pad having conductive particles therein preferably is interposed between the confronting conductors of the connector parts so as to assure the establishment of a conductive path between adjacent conductors even though there may be some differences in the levels of the conductors in their respective connector parts.

3,753,215
CABLE CONNECTOR

Stuart I. Moore, West Covina, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 12, 1971, Ser. No. 133,091
Int. Cl. H01r 13/72
U.S. Cl. 339—136 M **4 Claims**

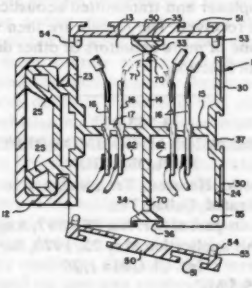


The invention disclosed herein provides a unique connector for making electrical contact by providing within the connector housing a storage area for enough additional cable to allow for installation variations in production line items.

3,753,216
HIGH VOLTAGE TERMINAL STRIP

Erlon Fitch Johnson, and Donald Eugene Crabb, both of Elizabethtown, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 14, 1971, Ser. No. 189,420
Int. Cl. H01r 9/00
U.S. Cl. 339—198 GA **6 Claims**

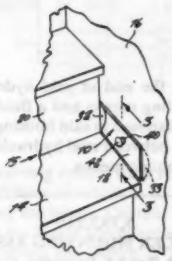


A terminal strip to provide for varying numbers and combinations of connections between input conductors and output conductors is disclosed. The strip is built up of any desired number of insulating block elements, each of identical structure, all mounted on a channel shaped track between end stops. The block elements have interlocking means, and they define plural cavities with sets of contact terminals inside the cavities to which the conductors are terminated in desired patterns. Barrier wall sections subdivide the cavities and separate sets of terminals. High voltage surge conditions can be successfully withstood due to cavity spacings, post spacings, presence of barrier walls, and use of insulating material for all elements except the contact terminals. Access cover means and cavity identifying marker means are also provided.

3,753,217
SINGLE RECESSED BASE LIGHT

Erich Willfurth, 31 W. Chestnut St., Farmingdale, N.Y.

Filed Aug. 31, 1971, Ser. No. 176,514
Int. Cl. E04f 19/00; F21v 33/00
U.S. Cl. 240—2 W **10 Claims**



A recessed light primarily for use in a staircase to be positioned within a recess in the baseboard or wall at one side of the staircase to illuminate a tread of the staircase. There may be one such light for each tread or they may be spaced in any desired manner to illuminate selected treads. The recessed light is formed as an open housing from a section of a sheet metal reentrant face with upper and lower lips to engage the upper and lower edges of a recess into which the housing snugly fits. The lips may be secured to said recess edges by nailing or by a suitable adhesive and may also be formed with integral projecting teeth or prongs to be driven into the recess edge portions for securing the housing in place. Provided centrally of the concave face of the housing is an opening for an electric light bulb. Each end of the housing is provided with an end wall so as to completely close off the recess. The housing may also take the form of a square-shaped frame at the outer edge of the concave face, the sides of the frame forming lips engageable with the outer side edge portions of the recess into which the housing is fitted.

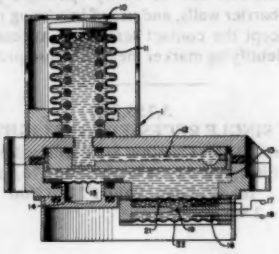
3,753,218
ELECTRO-MECHANICAL ACOUSTIC FILTER

Otto H. Hill; Herbert V. Hillery, both of Austin, Tex., and George B. Thurston, Stillwater, Okla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 21, 1956, Ser. No. 611,395
Int. Cl. H04r 23/00
U.S. Cl. 340—8 R **4 Claims**

1. A passive hydro-acoustic device for providing band pass filtering and detection of low frequency acoustic pressure signals transmitted through water and with said filtering occurring prior to transduction of said signals into electrical energy signals, which comprises input coupling means disposed to provide coupling of acoustic pressure signal intelligence from an external underwater sound field to the interior of said device, a fluid filled housing adapted to be closed by said input coupling means, a hydraulic tube disposed within

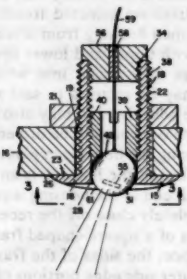
said housing and in fluid communication with said input coupling means, means in said housing for providing a substantially enclosed air volume in hydraulic shunt relation to said input coupling means, an electrolytic detector cell for providing an electrical signal output and disposed in fluid communication with the end of said hydraulic tube remote from said input coupling means and a fluid filled chamber of substantial capacity disposed in said housing for providing said fluid communication between said hydraulic tube, said detector cell and said air volume means.



3,753,219
TRANSDUCER MOUNTING ASSEMBLY

John L. King, Jr., P.O. Box 64, Sausalito, Calif.

Filed Sept. 30, 1971, Ser. No. 184,997
Int. Cl. H04b *11/00*
U.S. Cl. 340—5 R **3 Claims**



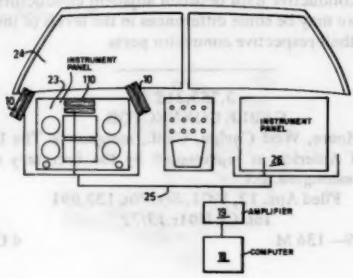
A through-hull fitting having a spherical socket into which an electrical transducer mounted within a ball can be adjusted to position the transducer in a vertically aligned axis.

3,753,220
AUXILIARY FLIGHT INSTRUMENT

Jean Rene Noel Lavarenne, Villecresnes, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Jan. 21, 1972, Ser. No. 219,675
Claims priority, application France, Jan. 28, 1971, 7102892
Int. Cl. G01d *7/02*
U.S. Cl. 340—27 R **9 Claims**

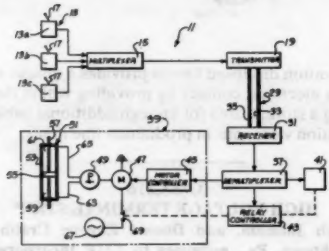
Auxiliary flight instrument, particularly a blind flying instrument comprising a rotating member bearing on one of its surfaces a pattern which through a stroboscopic effect is either visible or invisible depending on the rotation speed of said member, said pattern being devised so as to provide the pilot, when lacking exterior visual references, with a reflex-prompting display under blind flying conditions similar to when visual piloting conditions obtain.



3,753,221
ACOUSTIC CONTROL SYSTEM

Curtis E. Stevens, Irvine, Calif., assignor to Bertea Corporation, Irvine, Calif.

Filed Aug. 5, 1971, Ser. No. 169,345
Int. Cl. G08b *13/16*
U.S. Cl. 340—15 **15 Claims**



A control system including an input device for providing a plurality of variable input signals. The input signals are combined in a multiplexer and transmitted acoustically through a sound pipe to a receiver. The signals are then separated and transmitted to one or more actuators or other devices for performing a control function.

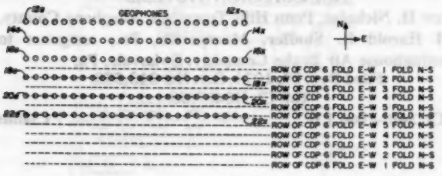
3,753,222
THREE DIMENSIONAL COMMON DEPTH POINT EXPLORATION

Maurice E. Trostle, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 853,897, Aug. 28, 1969, abandoned. This application May 22, 1970, Ser. No. 39,867
Int. Cl. G01v *1/20*
U.S. Cl. 340—15.5 MC **21 Claims**

Seismic wave detectors are located along a plurality of spaced apart parallel detecting lines. A plurality of seismic wave transmitting stations are located along a plurality of transmitting lines which are substantially perpendicular to the

detecting lines at one end thereof. Seismic waves are generated from sequential ones of the transmitting lines and


GEOPHONES
ROW OF CDP 6 FOLD E-W 1 FOLD N-S
ROW OF CDP 6 FOLD E-W 2 FOLD N-S
ROW OF CDP 6 FOLD E-W 3 FOLD N-S
ROW OF CDP 6 FOLD E-W 4 FOLD N-S
ROW OF CDP 6 FOLD E-W 5 FOLD N-S
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ROW OF CDP 6 FOLD E-W 3 FOLD N-S
ROW OF CDP 6 FOLD E-W 2 FOLD N-S
ROW OF CDP 6 FOLD E-W 1 FOLD N-S

are received by the detectors to provide three-dimensional common depth point coverage of the earth's subsurface.

3,753,223

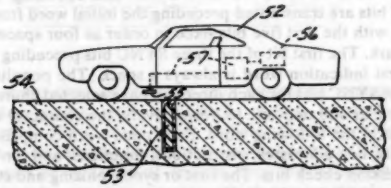
SYSTEM TO DETERMINE THE DIRECTIONAL MODE OF TRAVEL OF VEHICLES ON A ROADWAY

Richard E. Fayling, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 819,588, April 28, 1969, abandoned. This application Aug. 16, 1971, Ser. No. 171,904

Int. Cl. G08g 1/09

U.S. Cl. 340—32 **15 Claims**



Method and apparatus for automatically determining within a vehicle the directional mode of the vehicle on a roadway, directional mode being a description of the direction the vehicle is traveling and/or the orientation of the vehicle. The method distinguishes between at least two directional modes, using one or more discrete magnetic-field-producing means installed on roadways and magnetic-flux-sensors in vehicles. The flux-sensors develop a standard first electric signal by travel of the vehicles in a first directional mode over the magnetic-field-producing means and a second electric signal different from the first signal by travel of the vehicles in a second directional mode over the magnetic-field-producing means. Electric circuitry in the vehicles distinguishes between the first and second signals and actuates mechanism in the vehicles that registers the directional mode in which the vehicles are traveling on the roadways. One use of the invention is to limit wrong-way travel on one-way roadways, the second electric signal occurring only when the vehicles are traveling in the wrong direction and the registering mechanism taking the form of travel-inhibiting mechanism that warns a driver or automatically stops the vehicle.

3,753,224

LAMP FAILURE WARNING SYSTEM FOR ROAD VEHICLES

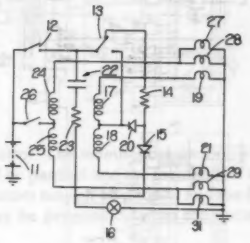
Rex Martin, Blackburn, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Apr. 21, 1971, Ser. No. 135,889

Claims priority, application Great Britain, May 2, 1970, 21,208/70

Int. Cl. B60q 1/44

U.S. Cl. 340—80 **3 Claims**



A lamp failure warning system for a road vehicle includes a pair of lamps the failure of which is to be monitored, and a switch for energising the lamps. Current sensing means is provided in series with the lamps for detecting failure of one lamp or the other, and when the switch is off current is passed through both lamps without illuminating them, and a warning is given if both lamps have failed.

3,753,225

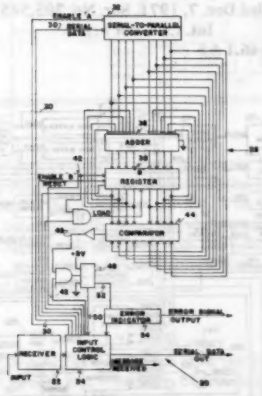
COMMUNICATION TECHNIQUE

Arlyn G. Liddell, Bountiful, Utah, assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 19, 1971, Ser. No. 200,371

Int. Cl. G06f 11/10

U.S. Cl. 340—146.1 AJ **7 Claims**

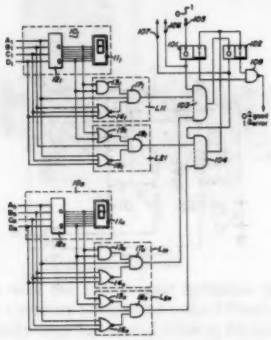


A technique for communicating binary data comprising adding the transmitted data signals to develop a check sum, transmitting the check sum immediately following the "end-of-transmission" signal, receiving the transmitted data signals together with said check sum, adding the data signals received to develop a received signal sum, and comparing said received signal sum with said check sum to verify message integrity. Both method and apparatus are disclosed.

3,753,226
MONITORING SYSTEM

Rudolf Schnurmann, and Klaus Brandts, Korschenbroich, both of Germany, assignors to Scheidt & Bachmann, GmbH, Rheydt, Germany

Filed Nov. 23, 1971, Ser. No. 201,451
Int. Cl. G08b 21/00, 29/00
U.S. Cl. 340—146.1 C 9 Claims

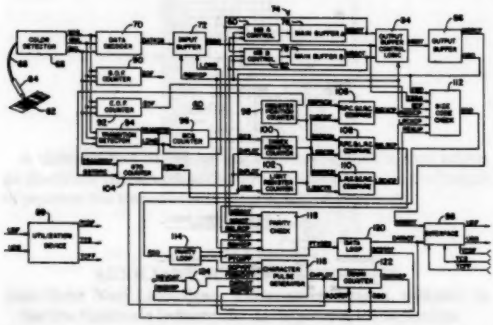


A monitoring system for the electric control of seven-element number indications in which a decoder supplied with binary number signals supplies the seven signals for the seven-element number indications. The monitoring system operates by feeding the signal for numeral 1 into the control and detects the signals to and from the decoder and if correct automatically supplies the signal for numeral 2 and again detects the signals to and from the decoder, and if the signals are again correct provides an indication that the control is functioning properly. If the control fails to operate correctly, an indication to that effect is given.

3,753,227
PARITY CHECK LOGIC FOR A CODE READING SYSTEM

Ramesh S. Patel, Kettering, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Filed Dec. 7, 1971, Ser. No. 205,545
Int. Cl. G06f 11/10
U.S. Cl. 340—146.1 AJ 10 Claims

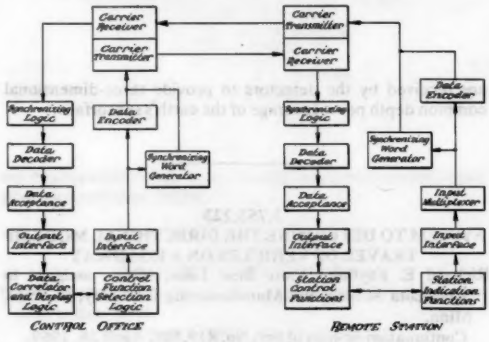


A system for processing a color bar code read optically from a coded medium is disclosed. The system includes logic for determining the binary code from color signals and storage means for temporarily storing the binary code. Logic is also provided which allows the reading of a double field tag and which checks the parity and the size of the captured message. Further, logic is provided for transmitting the captured message to a utilization device.

3,753,228
SYNCHRONIZING ARRANGEMENT FOR DIGITAL DATA TRANSMISSION SYSTEMS

Andrew H. Nickolas, Penn Hills Township, Allegheny County, and Harold R. Shaffer, Murrysville, Pa., assignors to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Dec. 29, 1971, Ser. No. 213,570
Int. Cl. H04l 7/08
U.S. Cl. 340—146.1 D 7 Claims



To provide startup time to overcome initial transmission delays or faults in the communication channel or code apparatus of a digital data remote control system, which may cause loss of synchronization, selected SYNC bits are transmitted immediately preceding the initial data word in either direction between the system office and any station. These SYNC bits need not all be received for data decoding. Seven SYNC bits are transmitted preceding the initial word from the office, with the first five bits fixed in order as four spaces and one mark. The first bit of the three SYNC bits preceding a station first indication word is always a space. The penultimate and last SYNC bits for each direction have selected characters the same as and opposite to, respectively, the character of the final bit in the following word. Each code word comprises 21 data bits, i.e., addresses, instructions, functions, and ten BCH transmission check bits. The first or synchronizing and station address word from the office to a station also includes six synchronizing or tag bits of fixed character preselectively spaced throughout the data bits. These must be received and decoded in their fixed character as part of the transmitted data, in addition to the BCH check, for the received code word to be accepted. Following words to the same receiver do not include SYNC or tag bits.

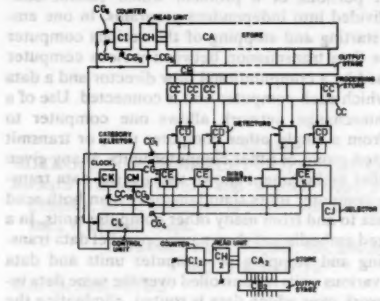
3,753,229
METHOD OF AND DEVICE FOR THE REMOVAL OF SHORT PROJECTING STROKE ELEMENTS OF CHARACTERS

Matthijs Beun, and Pieter Reinjnierse, both of Emmasingel, Eindhoven, Netherlands

Filed Nov. 9, 1971, Ser. No. 196,988
Claims priority, application Netherlands, Nov. 12, 1970, 7016538
Int. Cl. G06k 9/12
U.S. Cl. 340—146.3 MA 3 Claims

A method and system for skeletonizing characters in a character recognition technique. The junctions and the end points of a skeleton character are known. Series of character positions which start too close to a junction are removed. The length can be defined as the number of character positions in a series or as the number of character positions of the shortest

possible series which connects the end point of a series to the first junction of that series. The procedure may be started by



searching for end points, or by searching for junctions and subsequently for the end points situated nearby.

3,753,230

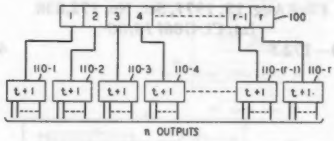
METHODS AND APPARATUS FOR UNIT-DISTANCE COUNTING AND ERROR-DETECTION

Charles William Hoffner, II, Columbus, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Jan. 3, 1972, Ser. No. 214,622

Int. Cl. G06f *11/00*

U.S. Cl. 340—146.1 AL **5 Claims**



A large class of multiple-error-correcting unit-distance counting codes and associated coding apparatus are presented. The class of codes includes the Gray codes, the Kautz codes, and the twisted ring counter codes as subclasses. The class of codes is of special importance because it is generated by counting circuitry which can be simply implemented. Furthermore, a subset of the codes has an easily determined converstion relationship to the ordinary binary counting codes that can be used as the basis for a simple error-detection method.

3,753,231

ELECTROLUMINESCENT DEVICES

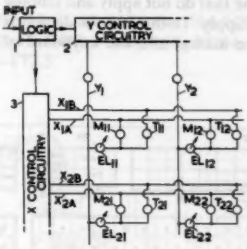
Cyril Hilsum, Malvern, England, assignor to the Secretary of State for Defence in her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland

Filed Oct. 4, 1971, Ser. No. 186,366

Int. Cl. G08b *5/22*; H05b *37/00*

U.S. Cl. 340—166 EL **10 Claims**

An electroluminescent device includes a first plurality of conductors, a second plurality of conductors forming a plurality of pairs of intersections with the first plurality of conductors, each pair of intersections having associated with it a combination of a region of electroluminescent material connected in electrical series with a solid state memory switch, the said combination being connected between a first conductor and a second conductor, and an electrical connection from the said combination to a third conductor, means for applying a voltage to which the region of electroluminescent material is responsive between the first conductor and the second conductor and means for applying electrical pulses between the first conductor and the second conductor having sufficient magnitude to switch the solid state memory switch between its conducting state and its impeding state. The said electrical connection may contain a solid state threshold switch or an



electrical capacitor. The members of the first plurality of conductors may all be parallel and the members of the second plurality of conductors may all be parallel and the first plurality of conductors may be perpendicular to the second plurality of conductors.

3,753,232

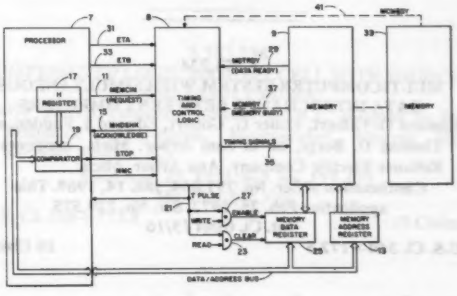
MEMORY CONTROL SYSTEM ADAPTIVE TO DIFFERENT ACCESS AND CYCLE TIMES

Michael Sporer, Somerville, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Apr. 6, 1972, Ser. No. 241,618

Int. Cl. G06f *9/00*; G11c *9/00*

U.S. Cl. 340—172.5 **15 Claims**



Logic, provided between a data processor and a memory, automatically functions independently of the access time and the cycle time of the memory utilized. The logic is further enhanced to automatically function with more than one type of memory concurrently coupled with the processor. Further, one or more memories may be concurrently coupled with more than one processor.

3,753,233

METHOD AND APPARATUS FOR DATA ENTRY

Nicholas W. Cardell, Jr., Westport, Conn., and Richard James Manzo, Somerset County, N.J., assignors to The Bunker-Ramo Corporation, Oak Brook, Ill.

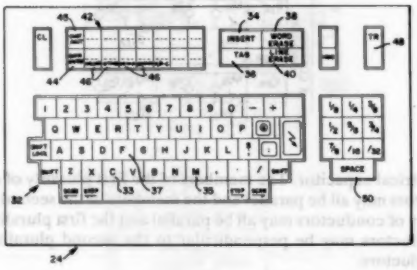
Filed Feb. 4, 1971, Ser. No. 112,637

Int. Cl. G06f *3/14*

U.S. Cl. 340—172.5 **36 Claims**

A data entry system employing input stations, each comprising a keyboard and a real time information display. An individual format guidance mask may be requested for display to facilitate a particular data entry. In the system disclosed,

the display is a cathode ray tube. Each format guidance mask incorporates alternative fields or words for the most often required information in the data entry requested. Alternative words are displayed in groups on the same line and are normally arranged from left to right according to their descending frequency of use. A data entry is composed by erasing the words in each line that do not apply and tabbing over the word or words that do apply. To this end the display is provided with a cursor or place marker and the keyboard of the invention



comprises a word erase key for erasing words one at a time, a tab key for tabbing over words one at a time, and a line erase key for erasing the remaining portion of a line. Thus, the most frequent keyed sequence is tabbing over the first and most frequently desired alternative word and line erasing the remainder of the line. The word erase key is only used if a less frequently chosen alternative is desired. A stock securities order data entry system is disclosed in detail.

3,753,234

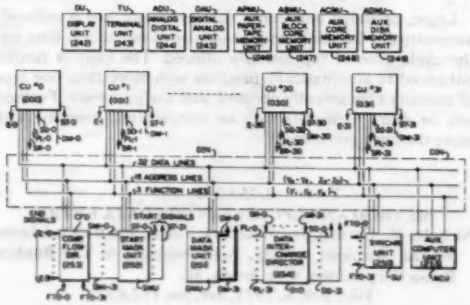
MULTICOMPUTER SYSTEM WITH SIMULTANEOUS DATA INTERCHANGE BETWEEN COMPUTERS

Edward O. Gilbert, Elmer G. Gilbert, Edward J. Fadden, and Thomas D. Berge, all of Ann Arbor, Mich., assignors to Reliance Electric Company, Ann Arbor, Mich.

Continuation of Ser. No. 791,064, Jan. 14, 1969. This application Feb. 25, 1972, Ser. No. 229,575

Int. Cl. G06f *15/16*

U.S. Cl. 340—172.5 **10 Claims**



A multicomputer system including a plurality of stored program digital computer units which are enabled to communicate directly with each other over one or more data interchange network means to allow a plurality of such computer units to simultaneously execute different programs to solve different portions of a problem which cannot conveniently be divided into independent programs. In one embodiment the starting and stopping of the various computer units and some data transmission between various computer units is governed by a computational flow director and a data mask unit to which each computer unit is connected. Use of a single data interchange network allows one computer to receive data from a single other computer unit, or transmit data to a selected group of other computer units, at any given time. In a further embodiment shown using serial data transmission, many computer units simultaneously man both send and receive data to and from many other computer units. In a further preferred embodiment shown using parallel data transmission, starting and stopping of computer units and data routing to the various units is controlled over the same data interchange network over which data is routed, eliminating the requirement for the computational flow director and various other equipment. The use of plural data interchange networks is shown, with conflict-determining circuitry to prevent a computer from being addressed simultaneously by more than one other computer unit.

3,753,235

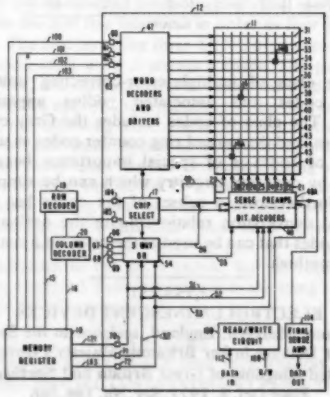
MONOLITHIC MEMORY MODULE REDUNDANCY SCHEME USING PREWIRED SUBSTRATES

James M. Daughton, Essex Junction; James J. Tomczak, Burlington, and Francis W. Wiedman, III, Essex Center, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 18, 1971, Ser. No. 172,838

Int. Cl. G06f *13/00*

U.S. Cl. 340—172.5 **4 Claims**



A monolithic memory module for memory systems capable of utilizing both good chips and partially defective chips. Each chip is provided with an extra bit line of storage cells that can be substituted for failing cells and a comparator circuit having pads that can be contacted externally by pre-wired substrates.

The pre-wired substrates are designed in different combinations to contact selected numbers of the pads and thus act as constant output read only memories to the chips mounted thereon. That is, each substrate contains connecting wiring for

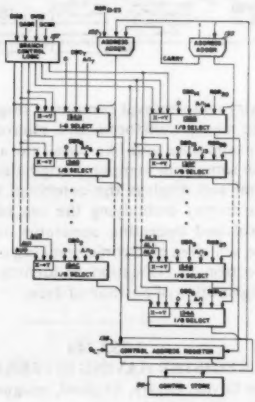
selectively contacting the pads of the comparator circuit either to identify the defective line and substitute for it the redundant line or to disable the redundant line when its use is unnecessary.

3,753,236

MICROPROGRAMMABLE PERIPHERAL CONTROLLER

Richard Thomas Flynn, and Marion Gene Porter, both of Phoenix, Ariz., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Mar. 31, 1972, Ser. No. 240,064
Int. Cl. G06f 9/10
U.S. Cl. 340—172.5 5 Claims



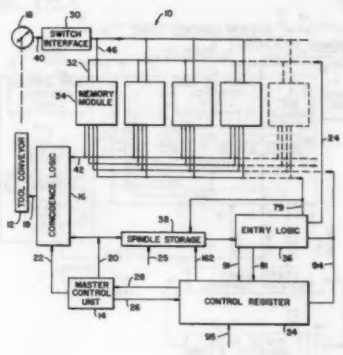
A microprogrammable peripheral controller is provided in which the control store microinstruction format is compatible with the read/write memory data word format and the architecture is compatible with character oriented peripheral data formats. The controller is provided with a processor which enables word transfers in a single operation. The processor also has the capability of performing a large repertory of arithmetic and logic microinstructions, but this is made economical by limiting such operations, in general, to byte length operands. With this processing capability, the primary controller control functions can be performed economically for a wide range of peripherals. A common interface is provided for data and control information transfers between the controller and both peripheral devices and central processor ports. In general, adaptor units are required to provide compatibility between the controller and the CPU ports and peripheral interfaces, to provide data buffering, to support multiplexing and for any other special functions. The primary feature to which this disclosure is directed is processor architectural features which effectively eliminate processor execution time for performing branching operations whereby processing speed is effectively increased by a factor of more than one third for many if not all control store programs. controller economy and reliability is further advanced by the use of dual arithmetic/logic modules which serve as redundant elements for byte operations and word transfer elements for word transfer operations.

3,753,237

ELECTRONIC STRUCTURE FOR AND METHOD OF RANDOM TOOL SELECTION

James L. Koontz; James D. Lewelling, both of Birmingham; Drake C. Fink, Ann Arbor, and Robert S. Sutton, Franklin, all of Mich., assignors to Ex-Cell-O Corporation, Detroit, Mich.

Filed June 23, 1971, Ser. No. 155,732
Int. Cl. G06k 17/00; B65g 47/34, 47/48
U.S. Cl. 340—172.5 10 Claims



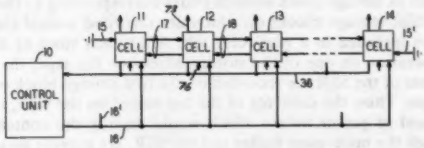
A completely electronic circuit for and method of random selection of a tool from a conveyor for use in a machining operation.

3,753,238

DISTRIBUTED LOGIC MEMORY CELL WITH SOURCE AND RESULT BUSES

David Morris Tutelman, Eatontown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Aug. 27, 1971, Ser. No. 175,477
Int. Cl. G06f 7/00
U.S. Cl. 340—172.5 15 Claims



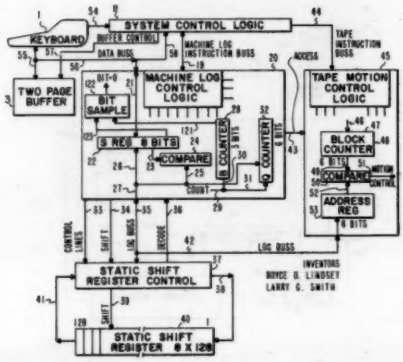
A distributed logic memory cell for a parallel cellular logic processor has a selectable-logic-operation circuit for coupling signals from a single-conductor source bus to a single-conductor result bus. Equally ranked control flip-flop circuits are also selectable for coupling signals in the opposite direction between the buses, as well as coooperating with instruction signals from a central control to determine whether or not a particular cell will be allowed to respond to other signals applied from the central control unit to all cells of the processor. Control signals are provided on a binary coded basis and decoded within each cell.

3,753,239

DATA FLOW IN A MACHINE LOG SYSTEM

Royce D. Lindsey, and Larry G. Smith, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1971, Ser. No. 158,347
Int. Cl. G06f 7/00; G11c 7/00
U.S. Cl. 340—172.5 5 Claims



An efficient system is disclosed for utilization in the storage address log portions of a typewriting system including a multi-page buffer and a substantially larger serial bulk memory. A keyboard-printer is connected to a multi-page buffer. Also connected to the multi-page buffer is a serial bulk memory which, in the preferred embodiment, is a magnetic tape cassette. The operator can temporarily store textual characters in the multi-page buffer and can transfer the buffer contents to the tape in the tape cassette for permanent storage. An address logging system is provided for assigning storage blocks on the tape for reading or recording. Included in this address logging system is an electronic static shift register (SSR) having stored therein indicia representative of the availability or unavailability for storage of each storage block on the tape. Also stored in the SSR of the address logging system are job identifying codes input by the operator from the keyboard as well as storage block address codes corresponding to the particular storage blocks on which are recorded textual characters included in a particular job. After each store or delete operation on one of the storage blocks on the tape, the contents of the SSR are recorded on the first storage block on the tape. Thus, the contents of the log stored on the tape, in the event of power failure which would destroy the contents of both the multi-page buffer and the SSR, are current up to the last completed job.

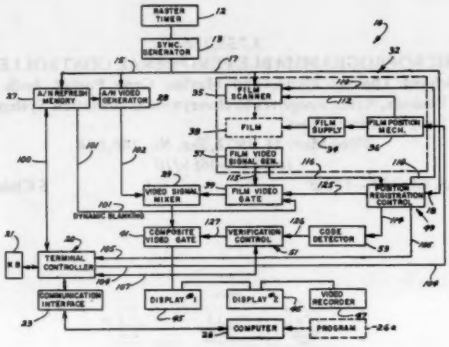
An efficient system is disclosed herein whereby the equal bit length job identifying codes and block address codes are distinguished from each other by the provision of a particular bit position in each code which is automatically set if the code is a job identifying code and automatically reset if the code is a block address code. Further, another bit position of a particular job identifying code and the block address codes associated with that job is automatically set upon the operator's inputting the particular job code from the keyboard. The availability or unavailability for storing characters on the storage blocks as well as the address of a particular block is determined by the set or reset status of a sequence of separate bits, with each bit individually representing a storage block on the tape.

3,753,240

DATA ENTRY AND RETRIEVAL COMPOSITE DISPLAY SYSTEM

Roy L. Merwin, Jordon, Minn., assignor to Dynamic Information Systems, Inc., Burnsville, Minn.

Filed Mar. 8, 1971, Ser. No. 122,003
Int. Cl. H01j 31/10
U.S. Cl. 340—172.5 10 Claims



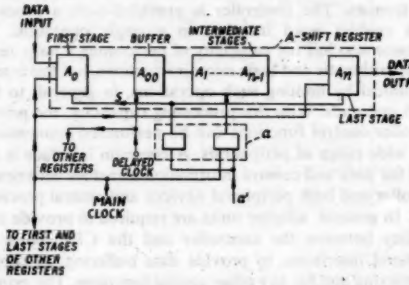
A data entry and retrieval composite display system which by electronic means transforms film, microfiche, transparent slides, video tape data and like data into a video signal and combines the same with computer originated data reduced to a video signal and displays the combined signals as a composite video display embodying the use of integrated electronic control and operating apparatus and programming, providing for selective electronic blanking and substitution of data, for electronic verification of identity of data and for electronic registration of position of data.

3,753,241

SHIFT REGISTER HAVING INTERNAL BUFFER

John Wallace Bayne, Earley, England, assignor to Sperry Rand Limited, New York, N.Y.

Filed Nov. 18, 1971, Ser. No. 199,955
Claims priority, application Great Britain, Nov. 26, 1970, 56,189/70
Int. Cl. G06f 5/00; H03k 5/13
U.S. Cl. 340—172.5 9 Claims

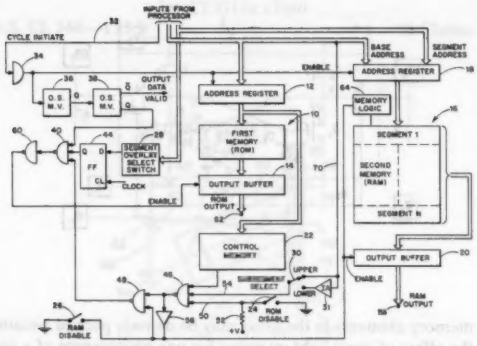


A shift register which includes an internal buffer for eliminating clock skew. The first and last cells of the register are driven by common clock pulses and the intermediate cells thereof and the buffer are driven by second and third clock pulses, respectively, having the same nominal rate as the common clock pulses. A plurality of such registers may be utilized in a digital data processing system where the first and last cells of the registers are all driven by the common clock pulses.

3,753,242
MEMORY OVERLAY SYSTEM

James F. Townsend, Framingham, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 16, 1971, Ser. No. 208,787
Int. Cl. G11c 7/00
U.S. Cl. 340—172.5 15 Claims

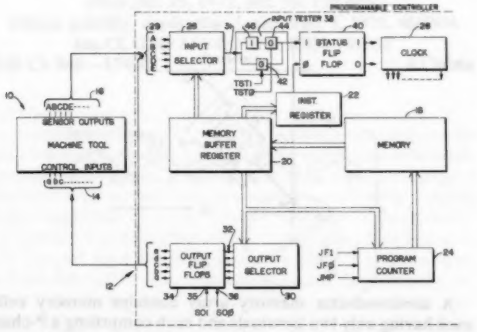


A read only memory (ROM) and a random access memory (RAM) overlayed to provide for three modes of operation: (1) ROM enabled, RAM disabled except as indicated by a control memory; (2) ROM disabled, normal RAM operation, and/or (3) ROM enabled, RAM disabled regardless of indication from control memory.

3,753,243
PROGRAMMABLE MACHINE CONTROLLER

Alan W. Ricketts, Jr., Derry, N.H.; Allan T. Devault; Russell C. Doane, both of Framingham, Mass.; John M. Dumser, Jr., Harvard, Mass., and John M. Holzer, Jr., Bogota, Colombia, assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 789,585, Jan. 7, 1969, abandoned.
This application Apr. 20, 1972, Ser. No. 170,266
Int. Cl. G05b 11/00
U.S. Cl. 340—172.5 25 Claims

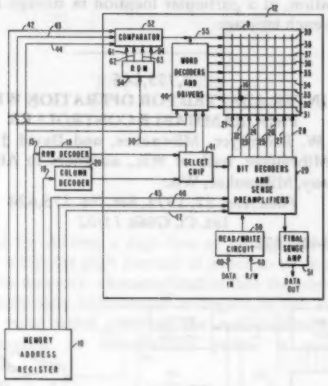


A controller for initiating and terminating the operations of a machine in response to the conditions of various sensors on the machine incorporates a data processor, which stores Boolean expressions governing the relationships between the sensor conditions and the machine operations. The processor sequentially compares the values of the individual independent variables of these expressions with the conditions of the corresponding sensors. Whenever a set of sensed conditions meets the criteria of one of the stored expressions, the processor emits a signal causing the machine to take the action governed by the expression.

3,753,244
YIELD ENHANCEMENT REDUNDANCY TECHNIQUE

John W. Sumilas, Williston, and Norbert G. Vogl, Jr., Colchester, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 18, 1971, Ser. No. 172,800
Int. Cl. G06f 13/00
U.S. Cl. 340—172.5 7 Claims

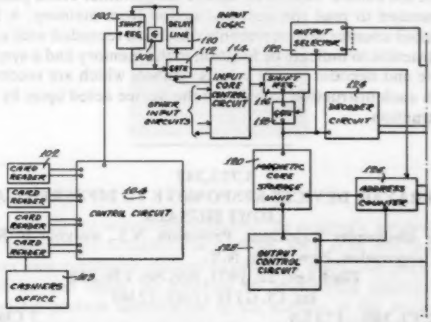


A memory storage system utilizing a plurality of storage devices, each of which contains redundancy and each of which is functionally organized on e.g. a single semiconductor chip with its own decoders. This redundancy in each device is provided by placing an extra line of cells on the chip together with a defective address store and a comparator circuit for disabling a defective line of cells and replacing it with the extra line of cells.

3,753,245
RECORD READING SYSTEM

Louis E. Philipps, Addison, Ill., and Eugene A. Stanis, Wheeling, Ill., assignors to Medelco, Incorporated, Wood Dale, Ill.

Division of Ser. No. 761,043, Sept. 20, 1968, Pat. No. 3,597,742. This application Mar. 8, 1971, Ser. No. 121,994
Int. Cl. G06f 3/06
U.S. Cl. 340—172.5 6 Claims



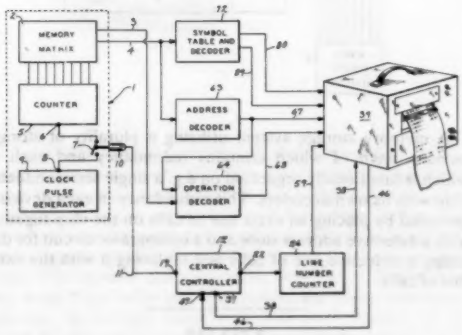
A hospital data handling system transmits and receives all message information normally required in hospital operations.

The system input is derived from permanent punch cards containing all message and control information and disposable punch cards containing variable data, such as patient identifying cards made, for instance, when a patient is admitted. A card reader located at each message originating location or station in the hospital provides messages which are placed in a delay line input storage time divided into slots so that a single delay line is shared by a group of card readers. The data in the delay line is erased as it is transferred out to system recorders and a central processor. The time slots in the delay line are permanently assigned to different card readers to permit continuous random access to the delay line. A control circuit automatically adds synchronizing signals when lacking from the input record and stores source identifying data, such as nurse identification, at a particular location in storage in conjunction with each message.

3,753,246
PRINTER ADAPTED FOR OPERATION WITH A PROGRAMMABLE CONTROLLER

William W. Kiffmeyer, Milwaukee, and David J. Sackman, West Milwaukee, both of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Aug. 27, 1971, Ser. No. 175,624
Int. Cl. G06k *15/02*
U.S. Cl. 340—172.5 **4 Claims**



A printer is attached to a programmable controller to read and record the program stored in its memory. The clock pulse generator in the programmable controller is disabled and clock pulses are generated by a central controller in the printer. Each clock pulse reads an instruction from the controller memory which instruction is decoded by the printer to select symbols on a digital printer. The digital printer visually records the instruction in response to a print command signal from the central controller, after which another clock pulse is generated to read the next instruction from memory. A line number counter selects symbols which are recorded with each instruction to indicate its location in the memory and a symbol table and decoder circuit selects symbols which are recorded with each instruction to indicate the device acted upon by the instruction

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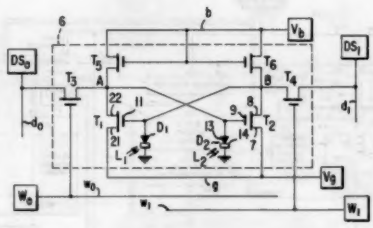
3,753,247
ARRAY OF DEVICES RESPONSIVE TO DIFFERENTIAL LIGHT SIGNALS

Jan Alexander Rajchman, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 22, 1971, Ser. No. 136,328
Int. Cl. G11c *11/42, 11/40*
U.S. Cl. 340—173 LS **7 Claims**

An array of memory elements is disclosed in which each memory element includes a bistable circuit having a differential input circuit including a pair of spaced photosensors. The bistable circuit is set to one or the other of its two states in accordance with which photosensor of the pair receives the greater amount of input light. The pairs of photosensors are arranged in interlaced herringbone fashion in the array so that every photosensor of a pair is positioned equidistant from the two photosensors of one adjacent pair of photosensors. The

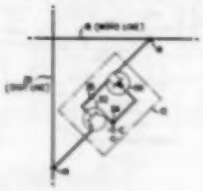


memory elements in the array may be densely packed because the effect of input light intended for one photosensor of a pair which may spill over to the equidistant photosensors of the adjacent pair of photosensors is cancelled in the differential input circuit connected to the adjacent pair of photosensors.

3,753,248
TWO-TERMINAL NONDESTRUCTIVE READ JFET-NPN TRANSISTOR SEMICONDUCTOR MEMORY

Dennis Joseph Lynes, Madison, N.J., and Peter Theodore Panousis, Salisbury Twp., Lehigh County, Pa., assignors to Bell Telephone Laboratories Incorporatad, Murray Hill, Berkeley Heights, N.J.

Filed June 9, 1972, Ser. No. 261,417
Int. Cl. G11c *11/40*
U.S. Cl. 340—173 R **7 Claims**



A semiconductor memory array contains memory cells, each having only two terminals and each comprising a P-channel, a JFET and an NPN transistor. The gate and drain of the JFET are respectively coupled to the collector and base of the NPN transistor. Bit information is written into the cell by causing or inhibiting conduction in the NPN transistor in order to set the potential of the gate of the JFET to one of two values which represent a "1" and a "0," respectively. A positive polarity voltage pulse applied to the source of the JFET causes nondestructive readout of information previously stored in the cell.

3,753,249

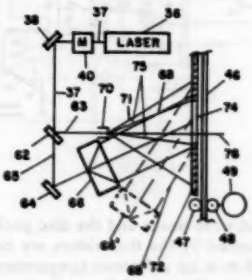
INFORMATION SYSTEMS USING ARRAYS OF MULTIPLE SPOT PATTERNS

Daniel Silverman, 5969 S. Birmingham, Tulsa, Okla.

Continuation of Ser. No. 67,135, Aug. 26, 1970, abandoned, which is a continuation-in-part of Ser. Nos. 612,698, Jan. 30, 1967, Pat. No. 3,550,085, and Ser. No. 721,998, April 17, 1968, Pat. No. 3,560,072. This application Aug. 9, 1972, Ser. No. 278,979

Int. Cl. G11c *13/00*

U.S. Cl. 340—173 R 26 Claims



The systems of this invention involve the storage of information on a record medium in the form of patterns of spots arrayed along one or more tracks, the patterns are spaced apart a distance which is a fraction of the length of the pattern so that there is partial overlap of the patterns along the track. The patterns may be uniformly or non-uniformly spaced spots, and the patterns can be sequentially the same or different patterns. All of the spots in the patterns have the same character, and are presented to a reading means sequentially. The spacing of patterns along the track may be uniform or variable. Each pattern may represent a single bit, or a single character.

3,753,250

CYLINDRICAL MAGNETIC DOMAIN PROPAGATING CIRCUIT AND LOGIC CIRCUIT

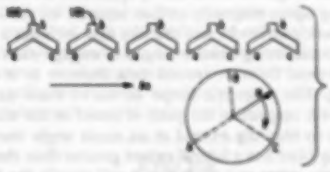
Fumio Yamauchi, Tokyo, Japan, assignor to Nippon Electric Company Limited, Tokyo-to, Japan

Filed Jan. 25, 1972, Ser. No. 220,665

Claims priority, application Japan, Feb. 1, 1971, 46/3876

Int. Cl. G11c *11/14, 19/00*; H03k *19/168*

U.S. Cl. 340—174 TF 4 Claims



A cylindrical magnetic domain propagating and logic circuit capable of retaining and propagating domains in response to a rotating magnetic field, in which the propagating and logic circuit comprises an arrangement of Y-shaped patterns of thin film soft magnetic material. The Y-shaped patterns have various size strokes and are positioned to effect various logic functions depending on the particular positions of the Y-shaped patterns and the relative size of the strokes.

3,753,251

BIPOLAR DRIVING METHOD AND DEVICE FOR A MAGNETIC THIN FILM MEMORY

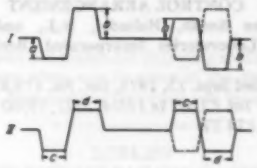
Nobuo Saito, Mikaka; Kiyoo Ito, Kodaira; Yutaka Watanabe, Hatano, and Kunihiko Yamaguchi, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 23, 1971, Ser. No. 117,908

Claims priority, application Japan, Feb. 27, 1970, 45/16837

Int. Cl. G11c *11/14, 11/04*

U.S. Cl. 340—174 PW 10 Claims



A method for driving a digit line of a magnetic thin film memory by a bipolar digit current in order to write an information in the memory, characterized in that the bipolar digit current is purposely unbalanced in regard to the amplitude and/or the pulse width whereby the insusceptibility of the magnetic record to interference pulses is remarkably enhanced.

3,753,252

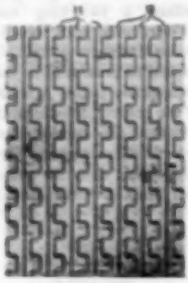
DISK PACK ASSEMBLY AND METHOD OF MAKING

Armin R. Tietze, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 28, 1971, Ser. No. 157,201

Int. Cl. H01f *10/00*

U.S. Cl. 340—174.1 G 22 Claims



A process for selectively affecting the magnetic properties in a magnetic particulate/resin material, such as an iron oxide-epoxy base coating as utilized on magnetic disks, disk pack assemblies and tapes, by creating an irreversible differential magnetic particle distribution in the surface of the material while maintaining the original surface topography, comprising the steps of exposing at least one preselected area of the surface for reaction with a reagent capable of converting the magnetic particulate material to a non-magnetic form, apply-

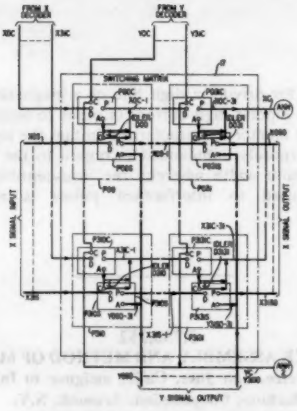
ing the reagent to the exposed areas, and removing the reagent from the preselected area of surface after a length of time sufficient to effect such conversion in the areas exposed, the reagent having the property of being substantially unreactive with the resin for the length of time of exposure.

3,753,253

MAGNETIC DOMAIN SWITCHING MATRIX AND CONTROL ARRANGEMENT

Robert McKee Smith, Holmdel, N.J., assignor to Bell Telephone Laboratories Incorporated, Berkeley Heights, N.J.

Filed Sept. 13, 1971, Ser. No. 179,831
Int. Cl. G11c *11/14, 5/02, 19/00*
U.S. Cl. 340—174 TF **20 Claims**



A magnetic domain switching matrix arrangement is realized by a magnetically soft overlay geometry which controls the movement of single wall domains in a slice of magnetic material in response to a reorienting magnetic field. The overlay geometry defines a switching matrix for domains propagated along a horizontal path, which domains are selectively transferred to an intersecting vertical path under control of a domain positioned in proximity to the selected intersection between the respective paths. A separate control grid is utilized to position the control domain at the desired intersection point. Also realized are arrangements for controllably delaying and for selectively routing the control domains in accordance with information domains propagated in separate control channels in a flow chart arrangement.

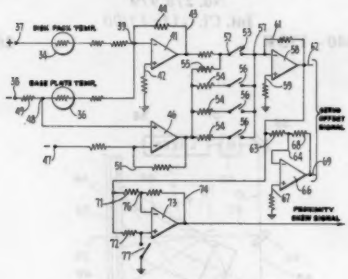
3,753,254

THERMAL EXPANSION COMPENSATION FOR DISC DRIVE MEMORY

Frank D. Ruble; Terence H. West, and Frank J. Sordello, all of San Jose, Calif., assignors to Information Storage Systems, Inc., Cupertino, Calif.

Filed Aug. 19, 1971, Ser. No. 173,033
Int. Cl. G11b *5/56*
U.S. Cl. 340—174.1 B **10 Claims**

Apparatus for a disc drive memory is described for continuously compensating for the effects of thermal expansion on the positioning of read/write heads with respect to a disc pack. The apparatus includes a thermister which is positioned to register temperature changes occurring in air which has passed in heat conducting relationship over a disc surface, as well as a thermistor for measuring a temperature representative of the average temperature of the support structure extending between the read/write heads and the disc pack. Changes in temperature detected by the thermistors are compared with one another and to a set reference temperature in order to generate a compensation signal for super-imposition on the positioning signal which regulates the head position controller so that a correction is made for the effect of thermal expansion on the positioning of the heads.

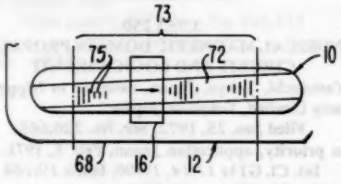


3,753,255

TRANSDUCING APPARATUS FOR SCANNING DATA RECORDABLE MAGNETIC STRIPES

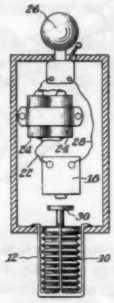
Hilliard R. Di Veto, Plymouth, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Oct. 4, 1971, Ser. No. 186,203
Int. Cl. G06k *7/015, 19/00;* **G11b** *5/48*
U.S. Cl. 340—174.1 M **5 Claims**



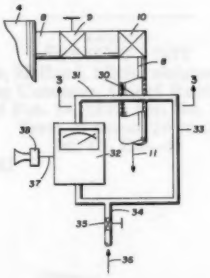
Relates to magnetic transducing apparatus for reading from and writing upon magnetic stripes secured to the outer surfaces of bank passbooks and the like and includes a traveling magnetic transducing head arranged to engage each magnetic stripe and read from or record data thereon as it is moved therealong. The magnetic stripe serves to store data and is oriented with respect to the path of travel of the transducing head so as to biasedly extend at an acute angle thereto. The transducing head has a lateral extent greater than the width of the magnetic stripe and such that it will overlie the full width of the magnetic stripe throughout its engagement therewith, thus spreading the wear to which the head is subjected as the result of such engagement. The data bearing area of the stripe is preferably spaced from and between the side edges and opposite ends of a patch adhering to the outer surface of a documentary member, such as a bank passbook. The biased relationship of the stripe to the read head will provide a broader engageable surface area to the transducing tip of the head, thereby spreading the wearing area and reducing the amount of material of the tip of the head which is worn away by repetitious engagements with magnetic stripes.

3,753,256
FIRE ALARM SYSTEM
Grover C. McDonald, Knoxville, Tenn., assignor to The Raymond Lee Organization, Inc., New York, N.Y.
Continuation of Ser. No. 831,537, June 9, 1969, abandoned.
This application Aug. 31, 1971, Ser. No. 176,726
Int. Cl. G08b 21/00; H01h 25/32
U.S. Cl. 340—227.1 1 Claim



A portable battery powered fire alarm device employing a bellows charged with a substance which causes expansion of the bellows. This expansion actuates a battery powered alarm.

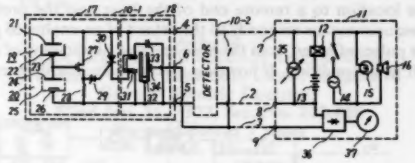
3,753,257
WELL MONITORING FOR PRODUCTION OF SOLIDS
Thomas Ben Arnold, Dallas, Tex., assignor to Atlantic Richfield Company, New York, N.Y.
Filed Feb. 28, 1972, Ser. No. 229,885
Int. Cl. G08b 21/00
U.S. Cl. 340—236 21 Claims



A method and apparatus for determining when solid particles are produced with a well fluid by utilizing a conductive means which is immersed in the produced well fluid and which is in a known conductive state, said conductive means being adversely affected as to its conductive state when exposed to solid particles such as sand in the well fluid.

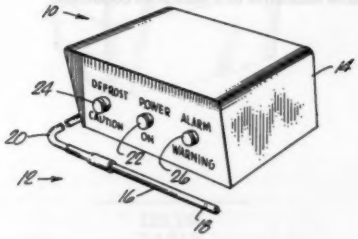
3,753,258
FIRE ALARMING SYSTEM
Yukio Honda, Nakano-ku, Tokyo, Japan, assignor to Nittan Company Limited, Tokyo, Japan
Filed Mar. 10, 1971, Ser. No. 122,956
Claims priority, application Japan, Mar. 31, 1970, 45/26844; Mar. 31, 1970, 45/26843
Int. Cl. G08b 25/00
U.S. Cl. 340—228 R 4 Claims

A fire alarm system having a plurality of fire detectors connected in parallel to a transmission line, each detector having a band pass filter resonating at a specific individual frequency. A receiver is connected to the transmission line and generates a plurality of frequencies corresponding to the frequencies of



the detectors and has means for detecting specific frequencies returned thereto when one or more of the detectors are activated by fire, thus enabling detection and location of a fire.

3,753,259
COOLER AND FREEZER FAILURE WARNING SYSTEM
Raymond L. Donovan, 1027-20th St., Santa Monica, Calif.
Filed Aug. 30, 1971, Ser. No. 175,976
Int. Cl. G08b 21/00, 23/00
U.S. Cl. 340—228 R 14 Claims

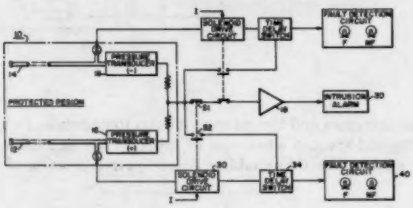


Cooling failure warning system for a refrigerated food case or the like, including a source of a rectified, pulsating, supply signal, a source of a lower regulated signal supplied by the supply signal source, a temperature sensor installed in a selected location of the food case and responsively variable in resistance according to its sensed temperature, means responsive to the sensor resistance for producing a switch signal at a predetermined overtemperature condition, means responsive to the switch signal for producing a delayed switch signal, a temperature alarm device, and an alarm switch responsive to the delayed switch signal for applying the supply signal to energize the temperature alarm device. The warning system further includes fail-safe provisions for producing an alarm in the event of sensor failure. A power failure alarm device responsive to a loss of the regulated signal can also be included in the warning system.

3,753,260
PULSE REFLECTION TEST MEANS FOR BALANCED PRESSURE SURVEILLANCE DETECTOR
Arthur Nelkin, and Frederick G. Geil, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Oct. 4, 1971, Ser. No. 186,109
Int. Cl. G08b 21/00
U.S. Cl. 340—242 5 Claims

In a buried hose pressure responsive detection system for monitoring intrusion of a designated area, a combination of a pressure transducer means and a pulse reflection test means for determining the integrity of the buried hose is positioned at

a common location in the hose for monitoring both intrusion of the designated area as well as providing random determination of the integrity of the hose. The pulse relfection test means functions to transmit a pressure pulse from the common location to a remote end of the hose and the pressure transducer means responds to the return of an unaltered pressure pulse reflected from the hose end as an indication of a no-fault hose condition. If however a hose fault condition exists,



i.e. a hose break, the travel of the pressure pulse is foreshortened and an air pocket present in the hose at the fault location reflects an inverted version of the pressure pulse back to the pressure transducer means. The pressure transducer means generates a first level dc signal in response to an unaltered pressure pulse indicative of a no-fault hose condition and a second level dc signal in response to an inverted pressure pulse indicative of a fault hose condition.

3,753,261

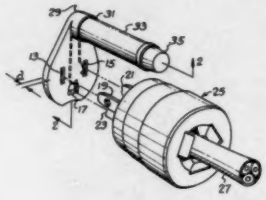
CONTINUOUS GROUND AND POLARITY MONITOR

Keith R. Thaxton, 12671 Volti Ln., Mountain View, Calif.

Filed Dec. 9, 1971, Ser. No. 206,288

Int. Cl. G08b *21/00*

U.S. Cl. 340—252 P **7 Claims**

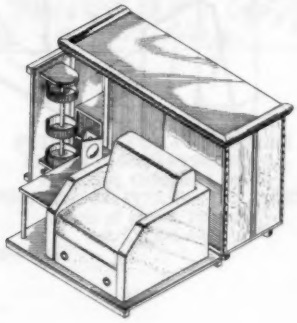


A disk has three apertures therein for receiving the hot, neutral and ground prongs of an a.c. line plug. In use the disk is slipped onto the prongs and positioned between the body of the line plug and a mating electrical outlet socket. An indicator lamp is fixedly attached to the disk and electrically coupled across the hot and ground prongs by friction tight contact at the corresponding apertures in the disk. The indicator lamp glows as long as a ground connection and proper polarity are maintained in the electrical outlet.

DESIGNS

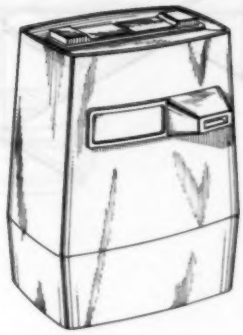
AUGUST 14, 1973

228,103
COMBINED BAR, CHAIR AND SIDE TABLE UNIT
Stanley H. Skalka, Springfield, Va., and Melvin R. Jones, Baltimore, Md., assignors to Victor Stanley, Inc., Dunkirk, Md.
Filed Mar. 20, 1972, Ser. No. 236,573
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—4



228,104
SEATING UNIT
Leif Blodee, Holland, Mich., assignor to American Seating Company, Grand Rapids, Mich.
Filed Feb. 14, 1972, Ser. No. 226,397
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—41

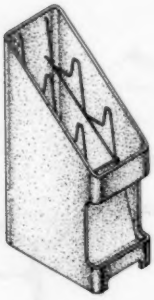
228,105
HEATED SHAVE CREAM DISPENSER
William J. Cook, Trumbull, Conn., assignor to General Electric Company
Filed Jan. 31, 1972, Ser. No. 222,450
Term of patent 7 years
Int. Cl. D6—*06*
U.S. Cl. D6—95



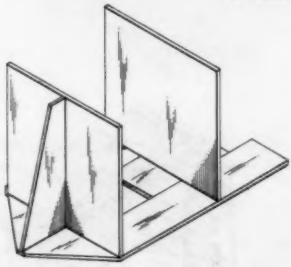
228,106
TABLE
Jack Klotz and Louise Klotz, Los Angeles, Calif., assignors to Environmental Concepts Products Co., Inc., Beverly Hills, Calif.
Filed Nov. 24, 1971, Ser. No. 202,053
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—117

228,107
DESK
Jack Klotz and Louise Klotz, Los Angeles, Calif., assignors to Environmental Concepts Products Co., Inc., Beverly Hills, Calif.
Filed Nov. 24, 1971, Ser. No. 202,056
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177

228,108
PHONOGRAPH RECORD DISPLAY UNIT
Wilbur J. Kerman, St. Louis, Mo., assignor to Cubicon Corporation, St. Louis, Mo.
Filed Feb. 10, 1972, Ser. No. 225,366
Term of patent 3½ years
Int. Cl. D6—*04*
U.S. Cl. D6—185

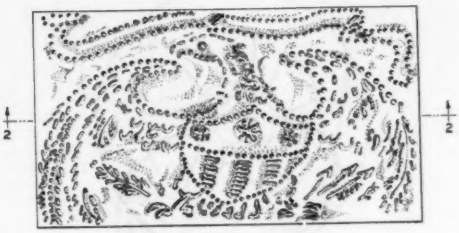


228,109
ADJUSTABLE RECORD HOLDER
Matthew B. Woods, Madley Road, Lebanon, Conn. 06249
Filed Feb. 10, 1972, Ser. No. 225,372
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—185

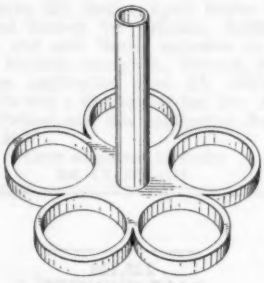


228,110
MERCHANDISE DISPLAY UNIT
Wilbur J. Kerman, St. Louis, Mo., assignor to Cubicon Corporation, St. Louis, Mo.
Filed Feb. 10, 1972, Ser. No. 225,371
Term of patent 3½ years
Int. Cl. D6—*04*
U.S. Cl. D6—186

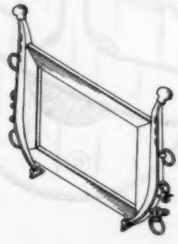
228,111
DECORATIVE PANEL
Herbert P. Lee, Brodbecks, Pa., assignor to Wilton/Lee, Ltd., Columbia, Pa.
Filed Aug. 17, 1971, Ser. No. 172,614
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—192



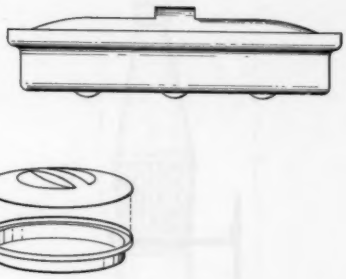
228,112
PEDESTAL FOR FURNITURE
Thomas Fedor, 125 Birch Ave., Hamilton, Ontario, Canada
Filed Mar. 24, 1972, Ser. No. 238,021
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—194



228,113
PICTURE FRAME
George A. Romancky, St. Helen, Mich. 48656
Filed Mar. 13, 1972, Ser. No. 234,448
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—244



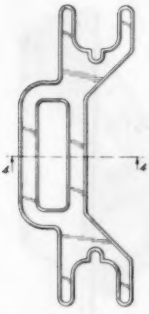
228,114
TORTILLA SERVING DISH
Richard De La Rosa, Hacienda Heights, Calif., assignor to ETL Corporation, San Jose, Calif.
Filed July 2, 1971, Ser. No. 159,161
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—17



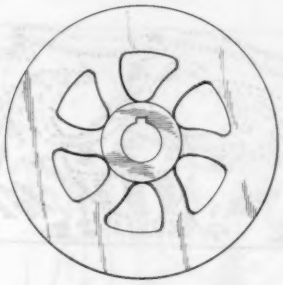
228,115
COMBINED HANDLE AND LOCK HOUSING
William P. Horgan, Jr., Pittsburgh, Pa., assignor to Blumcraft of Pittsburgh, Pittsburgh, Pa.
Filed July 7, 1972, Ser. No. 269,797
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—138

228,116
COMBINED PANIC DEVICE, HANDLE, AND LOCK HOUSING SET
William J. Horgan, Jr., Pittsburgh, Pa., assignor to Blumcraft of Pittsburgh, Pittsburgh, Pa.
Original design application Sept. 30, 1970, Ser. No. 25,284. Divided and this application Dec. 22, 1971, Ser. No. 211,165
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—149

228,117
SKI ROPE HOLDER
Ronald P. Turner, Southfield, Mich, assignor to Master Industries, Inc., Ansonia, Ohio
Filed May 30, 1972, Ser. No. 258,238
Term of patent 14 years
Int. Cls. D8—*08*, D22—*05*, D8—*06*
U.S. Cl. D8—158

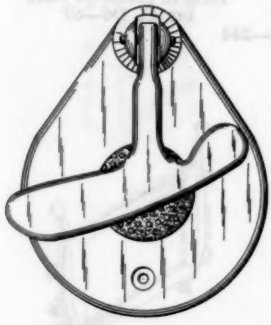


228,118
REVERSIBLE FEED LOADER DRIVE PULLEY
Gerald L. Kitson, 9709 Belding Road, Rockford, Mich. 49341
Filed June 26, 1972, Ser. No. 266,489
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—220

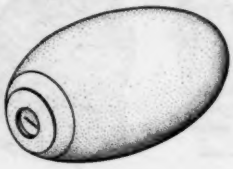


228,119
INSERT HOLDER SUPPORT DEVICE
Robert N. Cox, Cranbury, N.J., assignor to Stamco Industries, Belleville, N.J.
Filed Feb. 18, 1972, Ser. No. 227,707
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—254

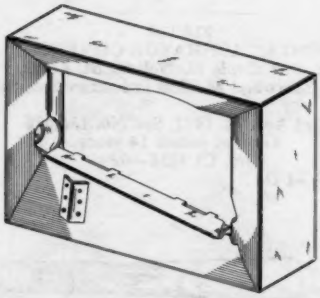
228,120
DOOR KNOCKER
Claudette A. LaBonte, 647 Gleneagle, New Seabury, Mass. 02649
Filed June 14, 1972, Ser. No. 262,502
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—277



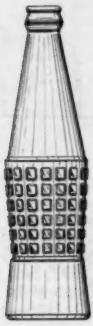
228,121
DISPENSING CONTAINER
Boris Sway, 7201 W. Aracoma Drive, Cincinnati, Ohio 45237
Filed Mar. 8, 1972, Ser. No. 232,989
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—2



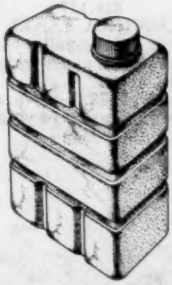
228,122
COMBINED PACKAGING AND DISPLAY CARTON FOR A POWER TOOL OR THE LIKE
Arthur L. Shreve III, Butler, Lyell Bayne Norris, Jr., Phoenix, and Robert W. Beichler, Baltimore, Md., said Shreve and said Norris assignors to The Black and Decker Manufacturing Co., Towson, Md.
Original design application June 23, 1969, Ser. No. 17,834, which was a division of Ser. No. 11,599, Apr. 24, 1968. Divided and this application June 8, 1970, Ser. No. 23,362
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—191



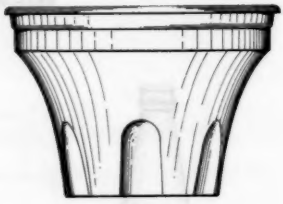
228,123
BOTTLE
Joachim Besler, an der Favorite 6, 6500 Mainz, Germany
Filed Nov. 9, 1970, Ser. No. 25,896
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—127



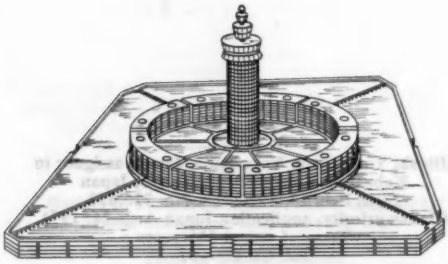
228,124
BOTTLE
Hitoshi Yamakawa, Yokohama, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed Feb. 15, 1972, Ser. No. 226,653
Claims priority, application Japan Aug. 26, 1971
Term of patent 3½ years
Int. Cl. D9—*01*
U.S. Cl. D9—168



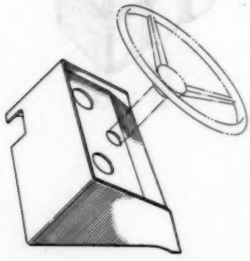
228,125
PACKAGING CUP OR THE LIKE
Franklin W. Weiss, 321 Ardsley Road, Longmeadow, Mass. 01106
Filed Nov. 17, 1971, Ser. No. 199,834
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—220



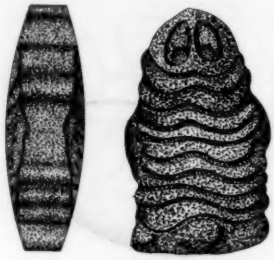
228,126
AIRPORT
John W. Magill, 664 N. Michigan Ave., Chicago, Ill. 60611
Filed June 14, 1972, Ser. No. 262,760
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 R



228,127
CONTROL PANEL
Mario F. Fernandez, Minneapolis, Minn., and Ronald E. Lewis, Hanover, N.H., assignors to The Toro Company, Minneapolis, Minn.
Filed Oct. 25, 1972, Ser. No. 300,835
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—6 P

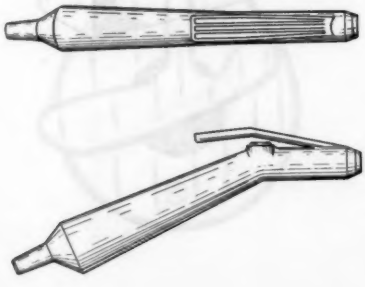


228,128
VITAMIN TABLET OR SIMILAR ARTICLE
Ian C. Modelevsky, Pleasantville, Benjamin S. DeYoung, Sands Point, and Donald Nevins, East Elmhurst, N.Y., and Morley A. Stern, Mexico City, Mexico, assignors to Bristol-Myers Company, New York, N.Y.
Filed June 27, 1972, Ser. No. 266,760
Term of patent 14 years
Int. Cl. D1—*01*; D28—*01*
U.S. Cl. D16—3

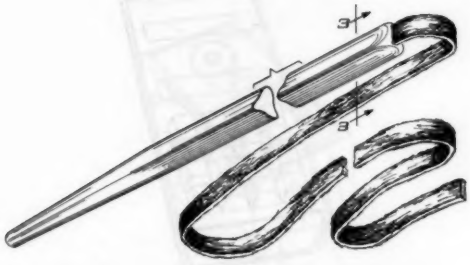


228,129
VITAMIN TABLET OR SIMILAR ARTICLE
Ian C. Modelevsky, Pleasantville, Benjamin S. DeYoung, Sands Point, and Donald Nevins, East Elmhurst, N.Y., and Morley A. Stern, Mexico City, Mexico, assignors to Bristol-Myers Company, New York, N.Y.
Filed June 27, 1972, Ser. No. 266,773
Term of patent 14 years
Int. Cl. D1—*01*; D28—*01*
U.S. Cl. D16—3

228,130
DENTAL ASPIRATOR CONTROL
Eli Schachet, and Denis H. Nelson, St. Louis, Mo., assignors to Sherwood Medical Industries Inc., St. Louis, Mo.
Filed Apr. 22, 1971, Ser. No. 136,626
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—1 D

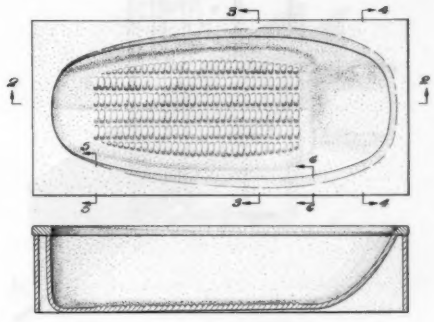


228,131
COMBINED DENTAL FLOSS STRIP AND MOLDED PICK END
Richard L. Wells, 4503 N. 32nd St., Phoenix, Ariz. 85018
Filed July 14, 1972, Ser. No. 271,774
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—1

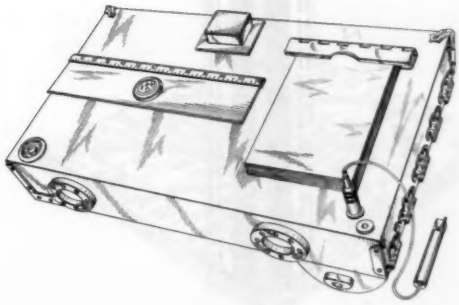


228,132
WALL EASEL
Dieter Fichtel, Muskegon, Mich., assignor to American Store Equipment Corporation, Muskegon, Mich.
Filed Apr. 29, 1971, Ser. No. 138,864
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D25—1 R

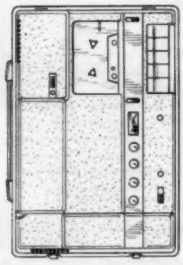
228,133
BATHTUB
Wayne M. Lippert, 2615 N. 75 St., Wauwatosa, Wis. 53215, and William L. Lippert, 398 Wildwood Ridge, Colgate, Wis. 53017
Original design application Mar. 16, 1971, Ser. No. 125,001. Divided and this application May 30, 1972, Ser. No. 257,994
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—55



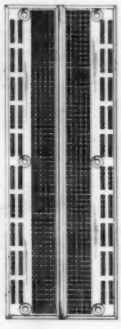
228,134
TEACHING DEVICE
Gerald J. O'Brien, 33 Pamrapo Ave., Jersey City, N.J. 07307
Filed Nov. 3, 1971, Ser. No. 195,537
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D25—1R



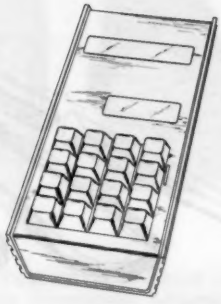
228,135
HOUSING FOR TEACHING MACHINE
Robert E. Haueter, Minneapolis, Minn., assignor to The Telex Corporation, Tulsa, Okla.
Filed Dec. 3, 1971, Ser. No. 204,802
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D25—1 R



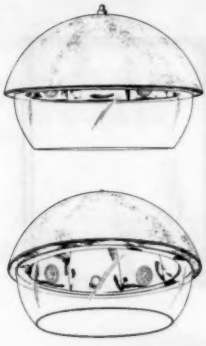
228,136
BREADBOARD FOR ELECTRONIC COMPONENTS OR THE LIKE
Ronald J. Portugal, North Haven, Conn., assignor to El Instruments Incorporated, Derby, Conn.
Filed Dec. 1, 1971, Ser. No. 203,938
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 R



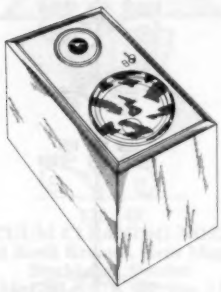
228,137
DATA ENTRY UNIT
George E. Chadima, Jr., 3624 Skylark Lane SE., Cedar Rapids, Iowa 52403
Filed Feb. 4, 1971, Ser. No. 112,837
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



228,138
HEAD-PHONE
Minoru Ohwada, Osaka, Hironosuke Kouda, Kyoto, and Masaaki Miyamoto, and Takeyoshi Kawano, Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Dec. 16, 1971, Ser. No. 209,022
Term of patent 14 years
Int. Cls. D14—*03;* D25—*99*
U.S. Cl. D26—14 A

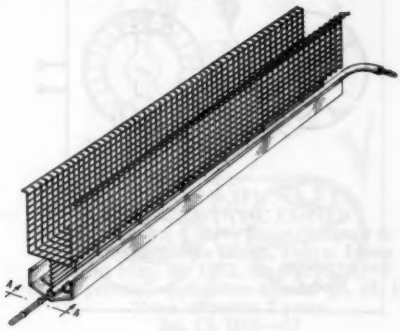


228,139
SPEAKER CABINET
Haruo Ishikawa, Tokyo, Japan, assignor to Kuraisura Denki Kabushiki Kaisha, Tokyo, Japan
Filed May 23, 1972, Ser. No. 256,218
Claims priority, application Japan Nov. 30, 1971
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 G



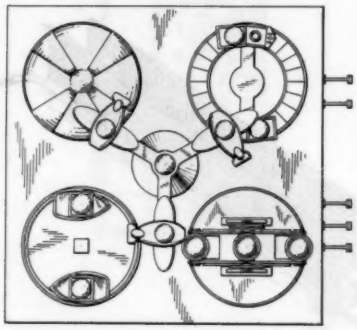
228,140
COMBINED FLAG AND HOLDER THEREFOR
Victor J. Richter, P.O. Box 50, Golden Valley Star Rte., Kingman, Ariz.
Continuation-in-part of design application Ser. No. 25,961, Sept. 13, 1970. This application Jan. 24, 1972, Ser. No. 220,545
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D29—17 A

228,141
POULTRY CAGE FEEDER
Gerald L. Kitson, 9709 Belding Road, Rockford, Mich. 49341
Filed Mar. 11, 1971, Ser. No. 123,494
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13



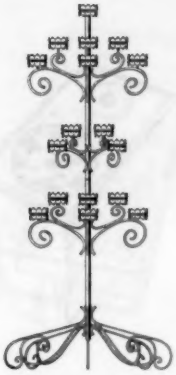
228,142
PLAY BOARD FOR A GAME
Joseph P. Mannina, 853 N. 5th St., San Jose, Calif. 95112
Filed Apr. 7, 1972, Ser. No. 242,286
Term of patent 14 years
Int. Cl. D21—*01*
U.S. D34—5 SS

228,143
TOY AMUSEMENT PARK
Norman Spiegel, New York, N.Y., assignor to NASTA Industries, Inc.
Filed Jan. 12, 1972, Ser. No. 218,665
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 Q

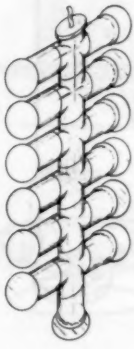


228,144
COMB FOR TURF MACHINES AND THE LIKE
William C. Lindquist, Merton F. Snyder, and Dale A. Klemenhagen, Minneapolis, Minn., assignors to Toro Manufacturing Corporation, Minneapolis, Minn.
Filed May 21, 1971, Ser. No. 145,991
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—1 R

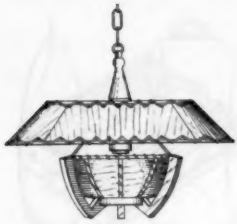
228,145
CANDELABRA
Robert L. Gordon, 3957 Drake's Branch Road, Nashville, Tenn. 37218
Filed Apr. 10, 1972, Ser. No. 242,910
Term of patent 3½ years
Int. Cl. D26—*01*
U.S. Cl. D48—2



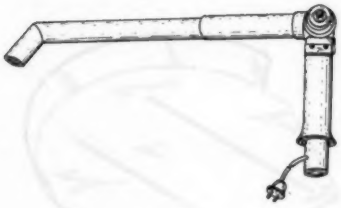
228,146
DECORATIVE LAMP
Randall H. Schwartz, 555 Cherokee Blvd., Knoxville, Tenn. 37919
Filed Apr. 3, 1972, Ser. No. 240,901
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 E



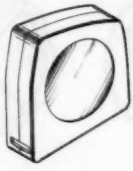
228,147
LAMP
Yedidya Boros, 15 Pinsker St., Rishon Le Zion, Israel
Filed Oct. 18, 1971, Ser. No. 190,443
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—23 R



228,148
VACUUM CLEANING NOZZLE
Ake Sigurd Bertil Kramer, Grev Magnigatan 5, Stockholm, Sweden
Filed Mar. 24, 1971, Ser. No. 127,857
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D49—17

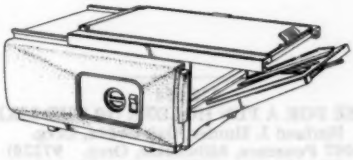


228,149
CASING FOR A TAPE MEASURE
Robert A. Bennett, Shelton, Conn., assignor to Waterbury Lock & Specialty Co., Milford, Conn.
Filed Sept. 20, 1971, Ser. No. 182,298
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—1 R

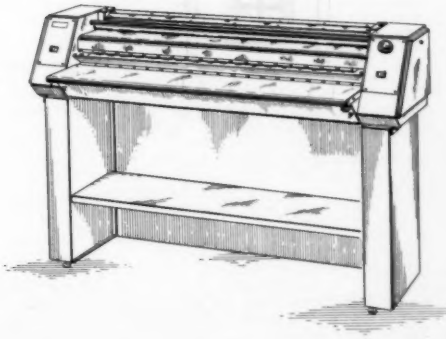


228,150
LENS CLUSTER UNIT FOR PHOTOPRINTING
Richard M. Artz, 3092 Silverton Road, NE., Salem, Oreg. 97308
Original design application May 28, 1970, Ser. No. 23,198. Divided and this application June 28, 1971, Ser. No. 157,812
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 Q

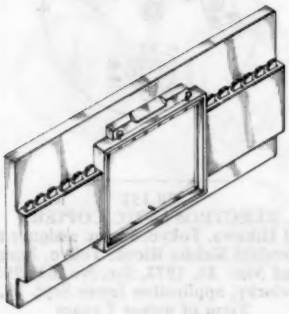
228,151
ELECTROSTATIC COPIER
Koji Hikawa, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed Mar. 28, 1972, Ser. No. 238,995
Claim priority, application Japan Sept. 29, 1971
Term of patent 7 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 Q



228,152
DIAZO COPYING MACHINE OR SIMILAR ARTICLE
Paul Matwey, Binghamton, N.Y., assignor to GAF Corporation, New York, N.Y.
Filed May 22, 1972, Ser. No. 255,923
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 Q

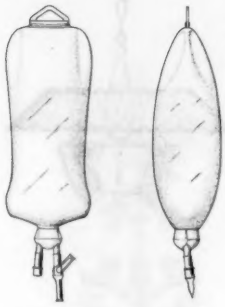


228,153
PERPETUAL CALENDAR HOLDER
Oscar Leighton Hilbert, 15610 NE. 35th Ave., Seattle, Wash. 98155
Filed Feb. 8, 1971, Ser. No. 113,781
Term of patent 14 years
Int. Cl. D19—*03*
U.S. Cl. D74—5 R

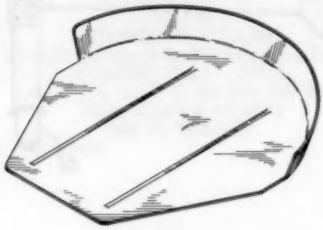


228,154
BASE FOR A PEN HOLDER OR THE LIKE
Harland J. Hunter, Oak Grove, Oreg. (3007 Penzance, Milwaukie, Oreg. 97220)
Filed July 24, 1972, Ser. No. 274,640
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—5 A

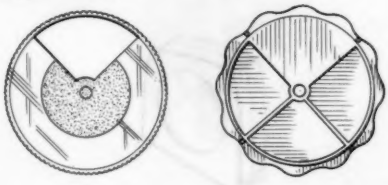
228,155
SEALED CONTAINER FOR STORING PARENTERAL AND OTHER SOLUTIONS
Philip G. Ralston, Jr., Buffalo Grove, Ill., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.
Filed Sept. 20, 1971, Ser. No. 182,290
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1 U



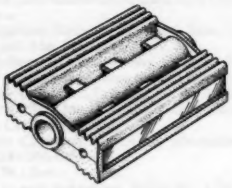
228,156
BIOPSY TRAY
Donald R. Antaya, 1656 Ebbets Drive, Campbell, Calif. 95008
Filed Dec. 10, 1971, Ser. No. 206,975
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1 U



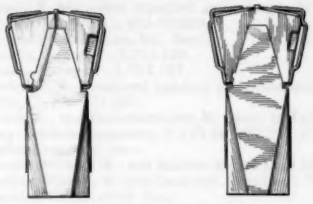
228,157
COMPACT
Morris Sussman, Freeport, N.Y., assignor to Shore Plastics Inc., Freeport, N.Y.
Filed Nov. 22, 1971, Ser. No. 201,267
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D86—10 N



228,158
PLASTIC REFLECTOR PEDAL
Carlton P. Pawsat, Maysville, Ky., assignor to Wald Manufacturing Company, Incorporated Maysville, Ky.
Filed May 22, 1972, Ser. No. 255,936
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D90—14



228,159
SAFETY RAZOR
Leopold K. Kuhnl, Stratford, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Nov. 26, 1971, Ser. No. 202,740
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D95—3 A



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 14TH DAY OF AUGUST, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aaron, Marvin Robert; and Kaneko, Hisashi, to Bell Telephone Laboratories, Incorporated. Digital attenuator. 3,752,970, Cl. 235-152.000.

Abcor Inc.: *See—*
Ryan, James M.; and Richardson, Carl, 3,751,966.

Abe, Masaaki: *See—*
Kurahashi, Koichiro; Nakada, Masancri; Sato, Harunori; Nishimura, Koichi; and Abe, Masaaki, 3,752,918.

Abolafia, Oscar Robert, to International Business Machines Corporation. Method of producing positive images from epoxy compositions and compositions therefor. 3,752,669, Cl. 96-36.200.

Abushanab, Elie, to Pfizer Inc. 2-Trifluoromethylquinoxaline-di-N-oxides. 3,752,812, Cl. 260-250.00r.

Achterberg, Dieter Christian. Electrical alternating contact switch. 3,752,945, Cl. 200-166.0bb.

Ackerman, Philip W.: *See—*
Cohen, Peter J.; and Ackerman, Philip W., 3,752,933.

Acme Paper Products Company Limited: *See—*
Lynch, Albert A., 3,752,388.

Adams, Phillip: *See—*
Ramunda, Angelo J.; Adams, Phillip; Beinfest, Sidney; and Gulakowski, Thaddeus A., 3,752,697.

Addressograph-Multigraph Corporation: *See—*
Baltazzi, Evan S., 3,752,668.

Adelliker, Hans Peter: *See—*
Diamantoglou, Michael; Adelliker, Hans Peter; Staub, Alfred; Bosshard, Hans; and Karlen, Urs, 3,752,831.

Adiska, Gary R.: *See—*
Sargent, Charles L.; Miller, Marshall W.; and Adiska, Gary R., 3,751,735.

Adret-Electronique: *See—*
Charbonnier, Roger, 3,753,100.

AGA Aktiebolag: *See—*
Johannisson, Dag O. A.; and Wictorin, Ake G. R., 3,752,654.

Agarwal, Paul D.; Johnston, Richard W.; Neuman, John G.; Preiser, Mark E.; Traub, Norman L.; and Schroeder, Thaddeus, to General Motors Corporation. System for controlling the torque output of an induction motor. 3,753,064, Cl. 318-227.000.

Agfa-Gevaert Aktiengesellschaft: *See—*
Schultes, Herbert; and Schlagheck, Norbert, 3,751,874.

Aguirre, Michael C., to Honeywell Information Systems Inc. Phase locked oscillator for integer pulse rates. 3,753,143, Cl. 331-8.000.

Ahlstrand, Richard G. Model house. 3,751,848, Cl. 46-19.000.

Aikoh Co., Ltd., mesne: *See—*
Boron, Joseph J., 3,751,986.

Air Cushion Equipment Limited: *See—*
Hopkins, Leslie A.; and Henvest, Robert R., 3,752,253.

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Akatake Engineering Company, Limited: *See—*
Watanabe, Akira, 3,752,446.

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Yamamoto, Hisao; Inaba, Shigeho; Hirohashi, Toshiyuki; Yamamoto, Michihiro; Ishizumi, Kikuo; Akatsu, Mitsuhiro; Maruyama, Isamu; Kume, Yoshiharu; Mori, Kazuo; and Izumi, Takahiro, 3,752,806.

Aktiebolaget Electrolux: *See—*
Blaeldh, Erik Arne, 3,751,747.
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Aktiengesellschaft: *See—*
Schwab, Johann; Zehner, Albert; Kratochvil, Egon; and Walter, Friedrich, 3,752,449.

Aktiengesellschaft Brown, Boveri & Cie: *See—*
Bellati, Hans, 3,752,427.
Bossi, Hans Jurg, 3,753,074.
Huwyler, Ernst; and Wenzel, Heinrich, 3,751,854.
Tan, Tuhing Thian, 3,753,087.

Akzo N.V.: *See—*
Van Duuren, Antony, 3,752,612.

Alburger, James R. Inspection penetrant process and composition for aiding removal of excess penetrant from test part surfaces. 3,751,970, Cl. 73-36.000.

Alcan Research and Development Limited: *See—*
Spoel, Han, 3,752,662.

Alder, Hanspeter, to Du Pont de Nemours, E. I., and Company. Self-sealing battery with nonaqueous electrolyte. 3,752,704, Cl. 136-6.00b.

Alef, Philip M. Masking devices. 3,752,304, Cl. 206-58.000.

Alfa Romeo S.p.A.: *See—*
Garcea, Giampaolo, 3,751,917.

Alfa-Laval AB: *See—*
Nilsson, Vilgot Raymond, 3,752,389.

Allan, Donald R. Microfilm transport and enlarger for making prints and plates. 3,752,578, Cl. 355-63.000.

Allegheny Ludlum Industries, Inc.: *See—*
Seitanakis, George P., 3,753,186.
Slitanakis, George P., 3,753,187.

Allen, Gordon Y. R. Combined isolating and neutralizing transformer. 3,753,189, Cl. 336-171.000.

Allen, Melvin K.; and Eschenbrucher, H. Peter, to Technical Devices Company. Soldering apparatus. 3,752,383, Cl. 228-37.000.

Allen-Bradley Company: *See—*
Kiffmeyer, William W.; and Radtke, Joseph D., 3,752,969.
Kiffmeyer, William W.; and Sackman, David J., 3,753,246.

Allied Chemical Corporation: *See—*
Chlanda, Frederick P.; Gregor, Harry P.; and Liu, Kang-Jen, 3,752,749.
Degginger, Edward R.; and Stealman, Thomas R., 3,752,234.
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Oxenrider, Bryce C.; Woolf, Cyril; Dear, Robert E. A.; and Beyleveld, Wilhelmus M., 3,752,840.
Psaras, John Dimocritos, 3,751,775.

Allington, Robert W., to Instrumentation Specialties Company. Apparatus for reducing the dissolved gas concentration in a liquid. 3,751,879, Cl. 55-158.000.

Allis-Chalmers Corporation: *See—*
Finke, Albert, 3,752,087.

Allison, Rudolph L.; and Goellner, Willy J., to Paramount Textile Machinery Co. Cutting apparatus and method. 3,752,023, Cl. 83-27.000.

Allmanna Svenska Elektriska Aktiebolaget: *See—*
Larker, Hans, 3,752,456.
Nilsson, Jan, 3,751,957.
Nilsson, Jan; and Larker, Hans, 3,751,958.
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Allstar Verbrauchsguter GmbH & Co. KG: *See—*
Krusch, Kurt; and Zimmermann, Hubert, 3,751,752.

Alstom-Savoisienne: *See—*
Aumont, Pierre, 3,753,101.

Alth, Max. Self-starting, single-phase, single-coil induction and synchronous motor. 3,753,017, Cl. 310-163.000.

Altshuler, Yakov Avranovich. Method of making thermopiles of foil. 3,751,798, Cl. 29-573.000.

Altunin, Yury Fedorovich: *See—*
Glazunov, Sergei Georgievich; Khrustsevich, Leonid Alexandrovich; and Altunin, Yury Fedorovich, 3,752,610.

Aluminum Company of America: *See—*
Trostle, John W.; and Martin, Norman L., 3,752,428.

Amana Refrigeration, Inc.: *See—*
Peterson, Donald E., 3,752,948.

AMBAC Industries, Inc.: *See—*
Kimberley, John A., 3,752,137.

Ambrose, William J.; and Mc Erlane, James F., to Du Pont de Nemours, E. I., and Company. Apparatus and method for fluid handling and sample. 3,752,197, Cl. 141-1.000.

Amemiya, Youichi: *See—*
Inaba, Seiuemon; Ito, Kohei; Shimizu, Kanryo; and Amemiya, Youichi, 3,752,038.
Inara, Seiuemon; Ito, Kohei; Shimizu, Kanryo; and Amemiya, Youichi, 3,752,001.

American Air Filter Company, Inc.: *See—*
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Thomas, John, 3,752,439.

American Cyanamid Company: *See—*
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American Smelting and Refining Company: *See—*

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Ametek, Inc.: *See—*
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Amiard, Gaston; and Van Thuong, Truong. Tris-$N^{\varepsilon 1}$,$N^{\varepsilon 21}$,$N^{\varepsilon 259}$-(3-X-3-oxo-1-y-prop-1-en-1-yl) LN-(4-Z-6-R-pyrinidin-2-yl)ornithine B^{30}] insulins and their preparation. 3,752,798, Cl. 260-112.700.

Amon, Max: *See—*
National Aeronautics and Space Administration, 3,752,559.

AMP Incorporated: *See—*
Johnson, Erlon Fitch; and Crabb, Donald Eugene, 3,753,216.
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Svendsen, Gordon D., 3,753,138.

Amtel, Inc.: *See—*
Koppelmann, Eldo K., 3,751,781.

Anderson, Albert W.; and Konrad, Charles E., to General Electric Company. Direct current chopper control circuit. 3,753,077, Cl. 321-45.00g.

Anderson Development Company: *See—*
Thompson, John F.; and Porter, Townsend H., 3,752,768.

Anderson, Gordon C.; and Drake, William H., to Maremont Corporation. Method and apparatus for donning bobbins. 3,751,895, Cl. 57-52.000.

Anderson, Howard R., to Caterpillar Tractor Company. Inertial air cleaner for gas turbine. 3,751,907, Cl. 60-39.09p.

Anderson, Walter R.: *See—*
Hamilton, Robert M.; and Anderson, Walter R., 3,752,175.

Ando, Shizuo. Telephone speech recording device. 3,752,930, Cl. 179-6.00r.

Andrews, Harry N.: *See—*
Frisch, Erling; and Andrews, Harry N., 3,752,737.

Andrews, Holt; and Bedrosian, Sirvart K., to Lipton, Thomas J., Inc. Green pea soup mix and method for making the same. 3,752,677, Cl. 99-124.000.

Aneja, Rajindra; and Chadha, Jaswinder Singh, to Lever Brothers Company. Phosphatide separation. 3,752,833, Cl. 260-403.000.

Anhang, William: *See—*
Morton, Arthur Francis; Belanger, Francois; and Anhang, William, 3,751,960.

Anken Industries: *See—*
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Anpa: *See—*
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Anstalt Europaische Handelsgesellschaft, mesne: *See—*
Gemperle, Bruno, 3,752,920.

Antipov, Igor; and Oberai, Avtar S., to International Business Machines Corporation. Production of high speed complementary transistors. 3,752,715, Cl. 148-187.000.

Aoki, Hisashi: *See—*
Imai, Kin-Ichi; Yoshioka, Yoshio; Toda, Jun; and Aoki, Hisashi, 3,752,804.

APEG-Hochdrucktechnik: *See—*
Kobusch, Klaus; and Manke, Arno, 3,752,311.

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Applied Fluidics, Inc.: *See—*
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Applied Life Design Corporation: *See—*
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Ardac/USA Incorporated: *See—*
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Arendsen, Hans: *See—*
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Arfert, Horst F. W., to Reynolds Metals Company. Sealed container same. 3,752,387, Cl. 229-43.000.

Arganbright, Robert P., to Petro-Tex Chemical Corporation. Process for the isomerization of olefins. 3,752,864, Cl. 260-683.200.

Arlt, Dieter; Bertram, Hans-Herwig; Pedain, Josef; Zankl, Erich; deceased (by Zankl, Helga); Zankl, Walter; and De Ramis, Angelika Zankl; heirs, to Bayer Aktiengesellschaft. Powdered coating materials. 3,752,793, Cl. 260-78.50t.

Armstrong, Phillip E.; Kaiser, Webster L., Jr.; Nichols, Newlin S.; Schmidt, John E.; and Stephenson, Orlando W., III, to BASF-Wyandotte Corporation. Anode mounting for electrolytic cell. 3,752,756, Cl. 204-252.000.

Arnal, Louis Henri Pierre, to Societe Anonyme Sefacal. Hot air generator using a gaseous fuel. 3,752,644, Cl. 432-222.000.

Arnett, Joseph W., Jr., to Concorde Fibers, Inc. Vacuum stripper. 3,751,756, Cl. 15-306.00a.

Arnold, Bruce C., to Twin Disc Incorporated. Reversing clutches with selector and pressure modulating valve. 3,752,281, Cl. 192-87.190.

Arnold, Thomas Ben, to Atlantic Richfield Company. Well monitoring for production of solids. 3,753,257, Cl. 340-236.000.

Arrowhead Enterprises, Inc.: *See—*
Kahl, William G., Jr.; and Davenport, Andrew J., 3,752,978.

Arthur Kommanditgesellschaft Klemt: *See—*
Klemt, Arthur, 3,752,561.

Asaba, Mitsuo: *See—*
Kaku, Kanji; Asaba, Mitsuo; Gondo, Yasaka; Kachi, Atsuyuki; and Matsumoto, Satoshi, 3,752,868.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
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Asahi Kogaku Togyo Kabushiki Kaisha: *See—*
Bokutomi, Seiorio, 3,752,048.

Ash, Eric A.; Dakss, Mark L.; and Kuhn, Lawrence, to International Business Machines Corporation. Leaky wave couplers for guided elastic wave and guided optical wave devices. 3,753,157, Cl. 333-7.00r.

Asher, John W.; and Herczog, Andrew, to Corning Glass Works. Frit capacitor. 3,753,057, Cl. 317-258.000.

Ashford, John Wesley: *See—*
Holm, Robert Leander; and Ashford, John Wesley, 3,751,802.

Ashikian, Baruir. Wind motor operated heating system. 3,752,395, Cl. 237-46.000.

Ashmore, Benson Pease & Company Limited: *See—*
Gamble, Peter Charles David; and Marsh, John, 3,752,218.

Aspinwall, Ronald A.; and Graham, MacKellar K., to Sperry Rand Corporation. Method of forming a magnetized helical coil. 3,753,183, Cl. 335-284.000.

Asplund, Robert W., to GTE Sylvania Incorporated. Electronic ignition timing system for internal combustion engines. 3,752,139, Cl. 123-146.50a.

Assmann, Allo, to Profilia-Werke Preckel & Waltermann. Convertible furniture. 3,751,739, Cl. 5-12.000.

Astratronics, Inc.: *See—*
Castonguay, Leon H., 3,752,950.

Ataka, Hisanori, to Ricoh Co. Ltd. Overhead projector. 3,752,575, Cl. 353-38.000.

Atkins, Jimmy G.: *See—*
Atkins, Luther C.; and Atkins, Jimmy G., 3,752,179.

Atkins, Luther C.; and Atkins, Jimmy G. Portable fire hydrant. 3,752,179, Cl. 137-272.000.

ATL Machine Corporation: *See—*
Hull, Gerry G.; and Morris, Eugene B., Jr., 3,751,871.

Atlantic Richfield Company: *See—*
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Bell, Larry N.; Knowles, Charles R.; and Schuh, Frank M., 3,752,232.

Atlas Copco Aktiebolag: *See—*
Schoeps, Knut Christian, 3,752,514.

Atsukawa, Masami. Device for manufacturing iron or non-ore-smelting type. 3,752,897, Cl. 13-20.000.

Aucouturier, Paul; and Hervier, Jean, to Thomson-CSF. Output devices for microwave tubes such as klystrons, and klystrons incorporating such output devices. 3,753,031, Cl. 315-5.390.

Audretsch, Leo M., Jr.; and Elsner, Matthew, to International Business Machines Corporation. Distinct complex signals formed by plural clipping transformations of superposed isochronal pulse code sequences. 3,752,921, Cl. 179-15.0bc.

Aumont, Pierre, to Alstom-Savoisienne. Faraday effect current measuring device. 3,753,101, Cl. 324-96.000.

Aumuller, Walter: *See—*
Winter, Werner; Fauland, Erich; Stach, Kurt; Schmidt, Felix Helmut; and Aumuller, Walter, 3,752,851.

Austin, William E.: *See—*
United States of America, National Aeronautics and Space Administration, 3,752,986.

Automation Industries, Inc.: *See—*
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Automobiles Peugeot: *See—*
Leger, Andre; and Mauron, Gerard, 3,751,950.
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Automotive Products Company Limited: *See—*
Chouings, Leslie Cyrie, 3,752,266.

Avalon Industries, Inc.: *See—*
Berman, Mort R., 3,752,433.

Avco Corporation: *See—*
Zar, Jacob L., 3,753,150.

Ayre, Vernon H., to United States of America, Army. Fluid gain change circuit. 3,752,171, Cl. 137-1.000.

Bach, Lloyd G., to Bendix Corporation, The. Hybrid brake booster using charging valve. 3,751,912, Cl. 60-405.000.

Bacskai, Robert Kensington, to Chevron Research Company. Nitrogen-containing P-tert-butylstyrene copolymers. 3,752,794, Cl. 260-88.1pa.

Bader, Horst, to Eckardt, J. C., A.G. Pneumatic two-position controller. 3,752,193, Cl. 137-829.000.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Kiehs, Karl; and Fischer, Adolf, 3,752,869.
Sinn, Richard; and Schellenberg, Rolf, 3,752,623.

Bailey, Cecil; and Frederick, Oscar C., to General Electric Company. Arcing contract for an electric circuit breaker and method of making same. 3,752,946, Cl. 200-166.00c.

Bailey, Gerald Dwight, to Johns-Manville Corporation. Asbestos yarn reinforced with continuous strand of a polyvinyl alcohol. 3,751,897, Cl. 57-144.000.

Baillie, James B., to Ameron, Inc. One piece elbow mold. 3,752,438, Cl. 249-184.000.

Baird, Albert W., III: *See—*
Lustig, Claude D.; and Baird, Albert W., III, 3,753,041.

Baker, Calvert W. Leash for an animal. 3,752,127, Cl. 119-109.000.

Baker, Myron Lewis; and Myers, Lewis William, to Coastal Dynamics Corporation. Uniform illumination with edge lighting. 3,752,974, Cl. 240-1.0el.

Bakker, Willem F. Shielding and gasketing material. 3,752,899, Cl. 174-35.0gc.

Balabaev, Georgy Matveevich; Boiko, Viktor Sergeevich; Malchenko, Viktor Matveevich; Misarenko, Stepan Nikolaevich; Tsitrin, Luvish Avrum-Abovich; Borzenko, Evgeny Ivanovich; and Golovko, Georgy Anatolievich. Method of air separation into oxygen and argon.3,751,933, Cl. 62-29.000.

Balde, Daniel: *See—*
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Ball Brothers Research Corporation: *See—*
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Ballantyne of Omaha, Inc.: *See—*
Nelson, Edward J.; and Brown, Ilo M., 3,752,569.

Ballard, Estus E. Wrench. 3,752,016, Cl. 81-64.000.

Balogh, Roy, to McCabe-Powers Body Company. Mobile derrick. 3,752,328, Cl. 212-145.000.

Baltazzi, Evan S., to Addressograph-Multigraph Corporation. Organic photoconductive members comprising dicyanomethylene substituted fluorene sensitizers. 3,752,668, Cl. 96-1.500.

Balzers Patent und Beteiligungs Aktiengesellschaft: *See—*
Kraus, Thaddaus, 3,751,965.

Ban, Itsuki. Magnetic tape cartridge play control means. 3,752,484, Cl. 274-4.00f.

Bardinet, Guy Marie Paul; and Keck, Roger Emile Jules, to Fabriques de Produits Chimiques de Thann et de Mulhouse. Process for preparing alkyl titanates from titanium tetrachloride and alcohols. 3,752,834, Cl. 260-429.500.

Bardons & Oliver, Inc.: *See—*
Hicks, Morris R.; and Le Veque, Joseph C., 3,752,036.

Barefoot, Carlton Keith. Apparatus for retreading tires. 3,752,726, Cl. 156-394.000.

Barilli, Filippo: *See—*
Cozza, Giorgio; Scaglia, Carlo; and Barilli, Filippo, 3,752,879.

Barker, Joseph K. Camper. 3,752,528, Cl. 296-23.00r.

Barko Hydraulics, Inc.: *See—*
Bartell, Maurice J., 3,752,338.

Barnes, William S. Apparatus for performing division and base conversion. 3,752,964, Cl. 235-92.0ca.

Barnett, Glenroy W.: *See—*
Crawford, Arthur R.; Barnett, Glenroy W.; Porter, Richard E.; and Pottebaum, Joseph R., 3,753,082.

Barough, Victor; and Glenn, Robert. Typewriter correction ribbon and process of manufacture. 3,752,291, Cl. 197-172.000.

Barrett, Jack H. Teaching or training aid system. 3,751,825, Cl. 35-6.000.

Barrow, Gilbert C.: *See—*
Massa, Frank; and Barrow, Gilbert C., 3,752,941.

Bartell, Maurice J., to Barko Hydraulics, Inc. Device for lining a drum with liner plates. 3,752,338, Cl. 214-147.00t.

Bartels, Friedrich. Load bearing structure. 3,752,089, Cl. 108-161.000.

Bartlett, Charles M. Throttle assist mechanical for motorcycle. 3,752,006, Cl. 74-489.000.

Bartley, Keith David; and Wewhirst, Fred Arlington, to Bell Telephone Laboratories, Incorporated. 184/146.00r. 3,752,927, Cl. .

Bartz, Melvin C., to Beckman Instruments, Inc. Prosthetic device for the deaf. 3,752,939, Cl. 179-107.00r.

Baryluk, Edward J., 20% to Lee, Raymond, Organization, Inc., The. Ski boot with cleaning device. 3,751,832, Cl. 36-2.5al.

BASF-Wyandotte Corporation: *See—*
Armstrong, Phillip E.; Kaiser, Webster L., Jr.; Nichols, Newlin S.; Schmidt, John E.; and Stephenson, Orlando W., III, 3,752,756.
Stephenson, Orlando W., III; and Schmidt, John E., 3,752,757.

Bassist, Rudolph G., 1/2 to Travis Mills Corporation. Warp knitting machine having exhausted spool detector and spool therefor. 3,751,937, Cl. 66-86.00a.

Battles, Willis R. Automatic action toy glider-kite string flyer. 3,752,424, Cl. 244-155.00r.

Bauchet, Pierre; and Carre, Jean-Claude, to Regie National des Usines Renault. Hydrostatic transmission control devices. 3,751,903, Cl. 60-19.000.

Bauer, Klaus: *See—*
Enke, Kurt; Bauer, Klaus; and Saftien, Udo, 3,752,497.

Baugh, Ronald K.; and Beeler, James E. Christmas tree ornament and decoration device. 3,752,407, Cl. 240-10.00t.

Baxendale, John W.: *See—*
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Bayer Aktiengesellschaft: *See—*
Arlt, Dieter; Bertram, Hans-Herwig; Pedain, Josef; Zankl, Erich; Zankl, Walter; and De Ramis, Angelika Zankl, 3,752,793.
Dhein, Rolf; Schnell, Hermann; and Raichle, Karl, 3,752,778.
Jautelat, Manfred; Kabbe, Hans-Joachim; and Ley, Kurt, 3,752,808.
Kalz, Dietmar; Wolf, Karlheinz; Wolfrum, Gerhard; and Hornle, Reinhold, 3,752,686.
Plumpe, Hans; and Puls, Walter, 3,752,818.
Raue, Roderich; and Kuhlthau, Hans-Peter, 3,752,822.
Raue, Roderich; and Kuhlthaus, Hans-Peter, 3,752,825.
Stolzer, Claus; Homeyer, Bernhard; and Hammann, Ingeborg, 3,752,871.
Zecher, Wilfried; and Merten, Rudolf, 3,752,791.

Bayha, Jack E., to Ardac/USA Incorporated. Coin orienting, sorting and dispensing apparatus. 3,752,168, Cl. 133-3.00d.

Bayne, John Wallace, to Sperry Rand Limited. Shift register having internal buffer. 3,753,241, Cl. 340-172.500.

Beavon, David K., to Parsons, Ralph, Company, The. Recovery of sulfur compounds from tail gases. 3,752,877, Cl. 423-244.000.

Beck, Louis: *See—*
Waterbury, Nelson J., 3,752,904.

Beck, Maurice Sidney, to National Research Development Corporation. Detection of electrostatic charge in flowing materials. 3,753,102, Cl. 324-109.000.

Becker, Brant W.: *See—*
Horwitz, Joshua; Gordon, Bernard M.; and Becker, Brant W., 3,751,791.

Becker, John E., to Eclipse Consultants, Limited. Valve controlled hydraulic coupling. 3,751,923, Cl. 60-359.000.

Beckman Instruments, Inc.: *See—*
Bartz, Melvin C., 3,752,939.
Chulay, Steven J., 3,752,390.
Sambhu, Mahesh K.; and Hinchey, John J., 3,753,098.

Bedford, John A.: *See—*
Hobbs, Charles C.; and Bedford, John A., 3,752,861.

Bedrosian, Sirvart K.: *See—*
Andrews, Holt; and Bedrosian, Sirvart K., 3,752,677.

Beehler, Vernon D.: *See—*
Weissenbach, Joseph, 3,752,355.

Beeler, James E.: *See—*
Baugh, Ronald K.; and Beeler, James E., 3,752,407.

Beermann, Claus; Georgi, Volkmar; Waldmann, Karl; and Wolf, Erhard, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. N,N-bis-halogenomethyl-carbamic acid esters. 3,752,845, Cl. 260-482.00c.

Beermann, Heinrich; and Lenting, Hans, to Siemens Aktiengesellschaft. Liquid-cooled electric machine, particularly turbogenerator. 3,753,013, Cl. 310-54.000.

Beezer, Earl F. Device for transmitting adjustable translatory movements in two axis-directions. 3,751,996, Cl. 170-53.000.

Begemann, Carl J., to Morris, Philip, Incorporated. Packaging of cigarettes. 3,752,308, Cl. 206-48.500.

Beijer, Louis Benjamin; Driessen, Antonius Jozephus Gerardus Cornelis; and Jacobs, Cornelis Adrianus Joannes, to U.S. Philips Corporation. Wall-stabilized high-pressure mercury lamp and metal iodide vapour discharge lamp with outer envelope. 3,753,018, Cl.313-25.000.

Beinfest, Sidney: *See—*
Ramunda, Angelo J.; Adams, Phillip; Beinfest, Sidney; and Gulakowski, Thaddeus A., 3,752,697.

Belanger, Francois: *See—*
Morton, Arthur Francis; Belanger, Francois; and Anhang, William, 3,751,960.

Belk, Earl H. Reversible recliner. 3,751,740, Cl. 5-37.000.

Bell & Howell Company: *See—*
Carlson, Richard K.; and Koeber, Henry J., 3,752,570.
Spencer, William H., 3,753,139.

Bell Canada-Northern Electric Research Limited: *See—*
Maheux, Peter Francis; and Van Dyk, Robert Maarten, 3,753,207.

Bell, Larry N.; Knowles, Charles R.; and Schuh, Frank M., to Atlantic Richfield Company. Well tool and method for using same. 3,752,232, Cl. 166-285.000.

Bell Telephone Laboratories, Incorporated: *See—*
Aaron, Marvin Robert; and Kaneko, Hisashi, 3,752,970.
Bartley, Keith David; and Wewhirst, Fred Arlington, 3,752,927.
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Bellati, Hans, to Aktiengesellschaft Brown, Boveri & Cie. Support arrangement for a turbomachine. 3,752,427, Cl. 248-19.000.

Beloit Corporation: *See—*
Crist, Elmer E., 3,751,822.
Gordon, John Henry, 3,752,629.
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Belvaux, Yves, to CSF-Compagnie Generale de Telegraphie Sans Fil. System of hologram reproduction. 3,752,557, Cl. 350-3.500.

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Bennett, Robert B., to Chromalloy American Corporation. Garment construction. 3,751,731, Cl. 2-227.000.

Bent, John H., to Minnesota Mining and Manufacturing Company, mesne. Pneumatic tool. 3,752,241, Cl. 173-163.000.

Bentz, Erwin J. H.; and Hiserote, Roger D., to Caterpillar Tractor Company. Dual cooling system for engines. 3,752,132, Cl. 123-119.0cd.

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Berkeley Pump Company: *See—*
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Berman, Mort R., to Avalon Industries, Inc. Translucent plastic candle mold. 3,752,433, Cl. 249-94.000.

Bermann, Francis; Courtaud, Paul; Dioux, Claude; Manifacier, Andre; Raboeuf, Andre; and Ruffet, Pierre, to Commissariat a l'Energie Atomique. Portable detector for dosimetry of X and gamma radiation. 3,752,985, Cl. 250-472.000.

Bernat, Henry A.; and Murray, William K., to Tri-State Oil Tool Industries, Inc. Pulling tool. 3,752,230, Cl. 166-98.000.

Bernold, Jean P., 50% to Pfeiffer, Hans Walter. Method of supporting exposed ground or rock. 3,751,929, Cl. 61-42.000.

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Bertram, Uwe; Hoffmann, Hans; and Neuhaus, Hans Wilhelm, to U.S. Philips Corporation. Integrated circuit comprising strip-like conductors. 3,753,005, Cl. 307-213.000.

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Beyard, Romayne M.; and Horai, John C., to GAF Corporation. Colored roofing granules. 3,752,696, Cl. 117-100.00d.

Beyleveld, Wilhelmus M.: *See—*
Oxenrider, Bryce C.; Woolf, Cyril; Dear, Robert E. A.; and Beyleveld, Wilhelmus M., 3,752,840.

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Bildahl, Richard L.; and Chandrasekaran, R., to Amerock Corporation. Drawer with snap-on front panel. 3,752,553, Cl. 312-330.000.

Billet, James; and Gough, Stanley T. D., to Mobil Oil Corporation. Method of combatting fungi using dimethyl 1,2,5-thiadiazol-3-yl phosphate. 3,752,887, Cl. 424-200.000.

Billin, Arthur G., to Sybron Corporation. Disposable electrode switch. 3,752,160, Cl. 128-303.170.

Billman, Kenneth W., to United States of America, National Aeronautics and Space Administration. Infrared tunable laser. 3,753,148, Cl. 331-94.500.

Bilobran, John, to General Motors Corporation. Rotary machine apex seal. 3,752,607, Cl. 418-124.000.

Binks, Chester J.; Helfer, Donald F.; Herbert, Ronald M.; and Kroll, Steve, to Restaurant Technology, Inc. Food holding cabinet. 3,752,549, Cl. 312-236.000.

Birke, August H., to Shell Oil Company. Dibenzimidazole-diurea grease thickening agents. 3,752,765, Cl. 252-51.50a.

Biro, F., Joseph. Ice guard for drinking glasses. 3,752,320, Cl. 210-469.000.

Biro Manufacturing Company, The: *See—*
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Bitterberg, Friedhelm, to Rheinstahl Henschel Aktiengesellschaft. Locomotive bogie having lifting dogs. 3,752,083, Cl. 105-1.00a.

Black Clawson Company, The: *See—*
Notbohm, Willard C., 3,752,734.

Blackwell, John, to Du Pont de Nemours, E. I., and Company. Water swollen cellulose and blends dyed with insoluble, non-vattable anthraquinone dyed in a glycol ether solution. 3,752,646, Cl. 8-21.00c.

Blaeldh, Erik Arne, to Aktiebolaget Electrolux. Surface cleaning apparatus. 3,751,747, Cl. 15-50.00r.

Blakshire, Allison W., to Sperry Rand Corporation. Forage harvester. 3,752,411, Cl. 241-189.100.

Blanchard, Hubert: *See—*
Bourgeois, Jacques; and Blanchard, Hubert, 3,752,627.

Blanchi, Torreno, to S.A.I.P. (S.p.A.). Fluid-dynamic press for the cold forming of sheet metal. 3,751,956, Cl. 72-57.000.

Bianchi, Torreno, to S.A.I.P. (S.p.A.). Fluid-dynamic press for the cold forming of sheet metal. 13,751,956, Cl. 72-57.000.

Blanz, John H.: *See—*
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Blechman, Frederick. Cassette tape movement indicator. 3,752,113, Cl. 116-114.00r.

Blechman, Robert M., to Pro-Tech, Inc. Liquid sampling. 3,751,990, Cl. 73-423.00r.

Blickens, Donald Arthur: *See—*
Roscoe, Henry George; Blickens, Donald Arthur; and Kupfer, David, 3,752,893.

Blinoff, William, Jr.; De Napoli, Robert A.; and Hart, Richard. Apparatus for heating or cooling a surface while simultaneously dispensing a liquid product thereon. 3,752,155, Cl. 128-65.000.

Blinow, Igor; and Leduc, Robert D., to Polaroid Corporation. Film advance actuated latch for a reflecting member. 3,752,051, Cl. 95-42.000.

Bliss, John W.: *See—*
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Block, Charles. Mechanical movement. 3,752,002, Cl. 74-404.000.

Block Engineering, Inc.: *See—*
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Blomberg, Folke Ivar; and Brynge, Per Gunnar. Exhaust silencer for internal combustion engines. 3,751,921, Cl. 60-324.000.

Blondeleau, Jacques; and Misseri, Marcel, to Regie National Des Usines Renault. Safety couplings for automotive steering columns. 3,752,007, Cl. 74-492.000.

Blount, Bobby J. Vehicle loading and storage system for wheeled containers. 3,752,336, Cl. 214-75.00t.

Blowers, Charles A.: *See—*
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Bluemel, Oscar. Shock-proof packing container. 3,752,301, Cl. 206-46.0fr.

Blumenthal, Gunter; and Krohm, Reinhold, to Klockner-Werke AG. Conveyor trough for scraper-chain conveyors. 3,752,299, Cl. 198-204.000.

Bochicchio, Philip J., to United States of America, Army. Variable length rotor apparatus. 3,753,208, Cl. 339-18.000.

Boehringer, C. H., Sohn: *See—*
Ost, Walter; Thomas, Klaus; Jerchel, Dietrich; and Appel, Karl-Richard, 3,752,842.

Boehringer Ingelheim G.m.b.H.: *See—*
Eberlein, Wolfgang; Heider, Joachim; Kobinger, Walter; and Diederen, Willi, 3,752,803.
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Boeing Company, The: *See—*
Runnels, Joe N.; and Strandbygaard, Svend, 3,752,422.

Boenke, Clyde A.; Reimink, Ronald L.; and Jackson, James A., to KMS Industries, Inc. CATV audio interaction system. 3,752,908, Cl. 178-5.600.

Boiko, Viktor Sergeevich: *See—*
Balabaev, Georgy Matveevich; Boiko, Viktor Sergeevich; Malchenko, Viktor Matveevich; Misarenko, Stepan Nikolaevich; Tsitrin, Luvish Avrum-Abovich; Borzenko, Evgeny Ivanovich; and Golovko, Georgy Anatolievich, 3,751,933.

Bokutomi, Seiorio, to Asahi Kogaku Togyo Kabushiki Kaisha. Error preventing means for flash synchronized photography. 3,752,048, Cl. 95-11.50r.

Bolden, Thomas O.: *See—*
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Bonas Machine Company, Limited: *See—*
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Bonazoli, Robert P.; and Kirkhuff, Ellison H., to GTE Sylvania Incorporated. Control circuit for varying the intensity of flash lamps. 3,753,039, Cl. 315-227.000.

Boncer, John J.: *See—*
Naidich, Herbert H.; and Boncer, John J., 3,753,032.

Booe, James M.: *See—*
O'Nan, Thomas C.; Walters, Charles W.; and Booe, James M., 3,751,797.

Boone, David E., to Standard Oil Company. Polymerization of olefins with a chromyl bis(triorganotitanate)catalyst. 3,752,795, Cl. 260-88.20r.

Boote, James: *See—*
Wright, Donald James; Boote, James; and Joyce, Burton, 3,752,259.

Boothe, Jerry Emile: *See—*
Gordon, Robert Cornelius, Jr.; Walker, Jerry Lee; Sharpe, Andrew Jackson, Jr.; and Boothe, Jerry Emile, 3,752,760.

Boothe, Jerry Emile; Sharpe, Andrew Jackson, Jr.; Walker, Jerry Lee; and Cornelius, Thomas Edward, III, to Calgon Corporation. Boiler water treatment. 3,752,761, Cl. 210-58.000.

Borden, Clarence W., to Goodall Rubber Company. Method of making hose or other tubular bodies of curable elastomeric material. 3,752,719, Cl. 156-84.000.

Borden, Samuel M.: *See—*
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Newton, Alwin B., 3,753,069.
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Boron, Joseph J., to Aikoh Co., Ltd., mesne. Sampling apparatus. 3,751,986, Cl. 73-425.40r.

Borzenko, Evgeny Ivanovich: *See—*
Balabaev, Georgy Matveevich; Boiko, Viktor Sergeevich; Malchenko, Viktor Matveevich; Misarenko, Stepan Nikolaevich; Tsirin, Luvish Avrum-Abovich; Borzenko, Evgeny Ivanovich; and Golovko, Georgy Anatolievich, 3,751,933.

Bosch, Robert, Fernschamlozen Gesellschaft mit beschrankter Haftung: *See—*
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Bosse, Robert Carl, to Escoa Fintube Corporation. I-type segmented finned tube. 3,752,228, Cl. 165-184.000.

Bosshard, Hans: *See—*
Diamantoglou, Michael; Adelliker, Hans Peter; Staub, Alfred; Bosshard, Hans; and Karlen, Urs, 3,752,831.

Bossi, Hans Jurg, to Aktiengesellschaft, Brown, Boveri & Cie. Parallel connection of surge voltage-resistant semiconductor elements such as diodes thyristors having differing avalanche voltage. 3,753,074, Cl. 321-11.000.

Bosworth, Donald Frederick, to Desoutter Brothers Limited. Press-tool sets. 3,752,540, Cl. 308-4.00c.

Botnick, Irgin. Flush button mixing valve. 3,752,191, Cl. 137-636.100.

Boulanger, Peter F., 20% to Lee, Raymond, Organization, Inc., The. Aerial toy. 3,751,850, Cl. 76-86.000.

Bourgeois, Jacques; and Blanchard, Hubert, to Sidel Societe Anonyme. Device for manufacturing a hollow article of plastic material. 3,752,627, Cl. 425-298.000.

Bourgraf, Elroy E.: *See—*
Ferneau, Richard H.; and Bourgraf, Elroy E., 3,752,527.

Bovenzi, Joseph L. Adjustable lantern bracket for boats. 3,752,108, Cl. 114-221.000.

Bowen, Dennis Dawes. Sequential switching device. 3,753,050, Cl. 317-141.00s.

Bowers, David A.; and Detolla, Frank L., to United Aircraft Corporation. Segmented duct seal. 3,752,598, Cl. 415-173.000.

Boyer, Jean-Jacques. Method for treating household refuse. 3,752,059, Cl. 100-37.000.

Boyson, Bertrand: *See—*
Detig, Robert H.; and Boyson, Bertrand, 3,752,288.

Brake, Cecil Clifford, to Scovill Manufacturing Company. Relay valve for tractor trailer brake systems. 3,752,190, Cl. 137-627.500.

Brand, Glen. Pressure compensated flow control valve. 3,752,182, Cl. 137-504.000.

Brandstadter, Jack M. Fluid-mechanical suspension system. 3,752,499, Cl. 280-124.00f.

Brandts, Klaus: *See—*
Schnurmann, Rudolf; and Brandts, Klaus, 3,753,226.

Branham, Norvil R.; and Pantaze, Peter C. Method and apparatus for stabilizing. 3,752,207, Cl. 157-13.000.

Branibar, Nick G., to Anken Industries. Film dispenser. 3,752,302, Cl. 206-52.00f.

Branson Instruments, Incorporated: *See—*
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Watson, James J., Jr., 3,752,381.

Braun, Martin, to Machlett Laboratories, Incorporated, The. X-ray tube anode target. 3,753,021, Cl. 313-60.000.

Brazzell, Jack W. Animal commode. 3,752,121, Cl. 119-1.000.

Breed, Laurence W.: *See—*
United States of America, National Aeronautic and Space Administration, 3,752,847.

Breitenbach, Otto, to Linde Aktiengesellschaft. Apparatus for controlling low temperature installations. 3,751,938, Cl. 62-126.000.

Bremer, Sherman L., to Bremertron XL Corporation. Adjustable extrusion head. 3,752,614, Cl. 425-113.000.

Bremertron XL Corporation: *See—*
Bremer, Sherman L., 3,752,614.

Briar, John R., to General Motors Corporation. Electromagnetic clutch. 3,752,279, Cl. 192-84.00c.

Briggs & Stratton Corporation: *See—*
Rubner, Hugo G., 3,751,952.

Briggs, Walton E.; and Fruzzetti, Paul R., to Varian Associates. Fixture and system for treating test pieces on a rapid cycle leak detection apparatus. 3,751,989, Cl. 73-40.700.

Brigham, George B. Modular building construction. 3,751,865, Cl. 52-92.000.

Bright, James A., to General Motors Corporation. Weigh bar switch arrangement for automatic ice maker. 3,751,939, Cl. 62-137.000.

Brilka, Rudolf: *See—*
Kind, Dieter; Harte!, Hagln; Salge, Jurgen; and Brilka, Rudolf, 3,753,042.

Brilloit, Jacques, to L'Air Liquide, Societe Anonyme pour l'Exploitation and des Procedes Georges Claude. Charging and discharging of lyophilisation apparatus. 3,751,820, Cl. 34-92.000.

British Aircraft Corporation Limited: *See—*
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British Petroleum Company Limited, The: *See—*
Du Chaffaut, Jean Amaudric, 3,752,739.

Broadhurst, Kent. Eyeglasses having interchangeable colored lenses. 3,752,567, Cl. 351-47.000.

Brooks, E. J., Company Incorporated: *See—*
Lundberg, George, 3,752,633.

Brosens, Pierre J. System and method for dynamic control of electrical rotary devices. 3,753,106, Cl. 324-125.000.

Brown & Root, Inc.: *See—*
Perot, Joseph Charles, 3,751,927.

Brown, Boveri & Cie Aktiengesellschaft: *See—*
Bunger, Franz; and Lehmann, Karl-Heinz, 3,753,070.

Brown, Herbert C. Carbonylation of organoboranes in the presence of complex metal hydrides. 3,752,860, Cl. 260-632.00r.

Brown, Ilo M.: *See—*
Nelson, Edward J.; and Brown, Ilo M., 3,752,569.

Brown, James A.; Chieves, Eddie G.; and Runyan, Wesley D., to Rust Engineering Company, The. Flume water recycling apparatus. 3,752,314, Cl. 209-173.000.

Brown, Peter Henry; and Webb, Derek Ivor, to Hydro-Mite Limited. Hydrostatic transmissions. 3,751,924, Cl. 60-485.000.

Brown, Phillip; and Hawkins, Peter, to Keystone Limited. Cyclic beam tufting machine. 3,752,095, Cl. 112-79.00a.

Brown, Thomas E.: *See—*
Treharne, Richard W.; and Brown, Thomas E., 3,752,747.

Browne Morse Co.: *See—*
Betts, Paul J., 3,752,548.

Bruneau, Louis O., to Polaroid Corporation. Method of manufacturing self-developing photographic film units. 3,752,723, Cl. 156-157.000.

Brynge, Per Gunnar: *See—*
Blomberg, Folke Ivar; and Brynge, Per Gunnar, 3,751,921.

Brynjegard, Olaf G. Astrological time corrector. 3,751,830, Cl. 35-44.000.

Bucciero, Henry R.: *See—*
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Buck, Tom E. Five way kitchen opener. 3,751,743, Cl. 7-14.600.

Buckbee-Mears Company: *See—*
Olson, Roger A.; Osero, Norman H.; and Mentone, Pat F., 3,752,754.

Bucourt, Robert; and Nedelec, Lucien, to Roussel-UCLAF. Novel 2-oxa-steroids. 3,752,855, Cl. 260-586.00h.

Buddemeyer, Bruce D. Multifunctional emulsification agents. 3,752,770, Cl. 252-356.000.

Bulk Liner Corporation: *See—*
Clarke, Edwin E.; and Florig, Albert J. (said Clark, assor. to), 3,752,344.

Bullock, Oakle P. Environmental air control unit. 3,752,226, Cl. 165-59.000.

Bulson, Douglas W., to General Tire & Rubber Company, The. Embossing roll with integral cooling means. 3,752,227, Cl. 165-89.000.

Bunch, Robert E., to Zenith Manufacturing Inc. Motor driven centrifugal pump. 3,752,603, Cl. 417-424.000.

Bunger, Franz; and Lehmann, Karl-Heinz, to Brown, Boveri & Cie Aktiengesellschaft. Protective circuit for electric motors. 3,753,070, Cl. 318-472.000.

Bunker-Ramo Corporation, The: *See—*
Cardell, Nicholas W., Jr.; and Manzo, Richard James, 3,753,233.

Burg, Martin S.; Carbonaro, Lynn M.; and Songco, Evelyn M., to Western Electric Company, Incorporated. Depuration of an aqueous solution containing vanadium and cobalt salts as impurities. 3,752,759, Cl. 210-50.000.

Burgess, William F., Jr. Portable drafting apparatus. 3,751,809, Cl. 33-80.000.

Burgett, James F.; Gorrell, Gerald A.; Mills, Norman D.; and Vandenberg, Lawrence J., to Ford Motor Company. Magnetic gauge with two V-positioned coils and having magnetic restoring ring. 3,753,107, Cl. 324-146.000.

Burke, Nelson W., to Honeywell Information Systems Inc. Crystal controlled frequency shift keying synchronous generating system. 3,752,922, Cl. 178-6 6.00r.

Burke, Nelson W., to Honeywell Information Systems Inc. Frequency shift keyed generating system. 3,752,923, Cl. 178-66.00r.

Burkhardt, Konstanz Gisbert: *See—*
Rapparlie, Hans; and Burkhardt, Konstanz Gisbert, 3,752,043.

Burkhardt, Max; Huber, Horst; and Chateau, Christian, to Concast AG and Concast Incorporated. Strand guide apparatus for continuous casting. 3,752,219, Cl. 164-282.000.

Burley, Cameron H., to Culbertson Industries, Inc. Method and apparatus for the recovery of synchronous carrier in a digital communication system. 3,753,114, Cl. 325-320.000.

Burlington Industries, Inc.: *See—*
Joss, Kurt; and Ruedi, Ernst, 3,752,650.
Morrison, Elbert F.; and Joy, Raymond D., 3,751,768.

Burlis, Norbert W.; and Corbett, Joseph H., to Sherwood Medical Industries Inc. Apparatus for extruding products of plural components of varied proportions with scrap reclamation. 3,752,617, Cl. 425-131.000.

Burroughs Corporation: *See—*
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Kronies, Reinhard Kurt; and Coupland, John Robert, 3,753,014.
Sims, Dewey M., Jr.; and Price, Franklin H., Jr., 3,752,513.

Burwen, Richard S. Variable bandpass dynamic noise filter. 3,753,159, Cl. 333-17.000.

Bush, Ian E., to Cybertek, Inc. Method and apparatus for extraction of solvent extracts. 3,752,651, Cl. 23-230.00r.

Bushnell, Sherman W., Jr. Multi-stage life. 3,752,261, Cl. 182-17.000.

Buss, Benjamin Alvin; and Buss, Donald C., to Ametek, Inc. Single operator sheet folder. 3,752,470, Cl. 270-80.000.

Buss, Donald C.: *See—*
Buss, Benjamin Alvin; and Buss, Donald C., 3,752,470.

Bustin, Leopold. Traction mat. 3,752,396, Cl. 238-14.000.

Busuttil, Henry L.; Kreisler, Sol S.; McGibbeny, James R.; and Pearson, Russell O., to TRW Inc. Electrical connector with coaxial contacts. 3,753,206, Cl. 339-16.00c.

Butwell, Robert J., to Varian Associates. Composite microwave window and waveguide transform. 3,753,171, Cl. 333-98.00p.

Byrne, Stanley William: *See—*
Lyon, Henry; Mathewson, Harald David; Williamson, James Thomson Davidson; and Byrne, Stanley William, 3,752,166.

Byrt, Graham Archie Bruce, to Masson Scott Thrissel Engineering Limited. Winding of continuous webs on to reels. 3,752,412, Cl. 242-56.00a.

Cahill, Harold James; and Erickson, Cornelius James, to Du Pont de Nemours, E. I., and Company. Electrical resistance heating control circuit. 3,752,956, Cl. 219-505.000.

Calder, Oliver Jerome. Combined spray and anti-clogging means. 3,752,400, Cl. 239-116.000.

Calgon Corporation: *See—*
Boothe, Jerry Emile; Sharpe, Andrew Jackson, Jr.; Walker, Jerry Lee; and Cornelius, Thomas Edward, III, 3,752,761.
Gordon, Robert Cornelius, Jr.; Walker, Jerry Lee; Sharpe, Andrew Jackson, Jr.; and Boothe, Jerry Emile, 3,752,760.

Calhoun, Donald F.; and Ziff, Robert E., to Hughes Aircraft Company. Expandable sum of cross product multiplier/adder module. 3,752,971, Cl. 235-164.000.

California Institute of Technology: *See—*
Kolbly, Richard B., 3,753,116.

Callaham, John E., to Procter & Gamble Company, The. Photosense detecting and removing stuck chips from a carrier of a chip frying machine. 3,752,676, Cl. 99-100.00p.

Calmac Manufacturing Corporation: *See—*
MacCracken, Calvin D.; and Schmidt, Helmut J., 3,751,935.

Camco, Incorporated: *See—*
McGowen, Harold E., Jr.; and Terral, Ben D., 3,752,231.

Camp, Harold E.: *See—*
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Campari, Luigi: *See—*
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Campbell, Loran William, Jr., to Bell Telephone Laboratories, Incorporated. Digital ratio circuit including zero suppression. 3,752,972, Cl. 235-196.000.

Campbell Soup Company: *See—*
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Canadian Patents and Development Limited: *See—*
Smith, Chester A. M., 3,752,086.

Cane Machinery & Engineering Company, Inc.: *See—*
Gomez, Ivan, 3,752,335.

Cannell, Fred J. Door bolt. 3,752,518, Cl. 292-42.000.

Cannon, Cynthia: *See—*
Waterbury, Nelson J., 3,752,904.

Cannon, William A.: *See—*
Toy, Madeline S.; and Cannon, William A., 3,752,703.

Canon Kabushiki Kaisha: *See—*
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Canon Kabushiki Kaisha, mesne: *See—*
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Carbonaro, Lynn M.: *See—*
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Cardell, Nicholas W., Jr.; and Manzo, Richard James, to Bunker-Ramo Corporation, The. Method and apparatus for data entry. 3,753,233, Cl. 340-172.500.

Cardwell, Paul H.: *See—*
Kane, Wills; and Cardwell, Paul H., 3,752,745.

Carley, Joseph E.; and Steup, Emil A. Auto battery theft preventing device. 3,752,254, Cl. 180-68.500.

Carlson, John H., to USM Corporation. Sequential rotary and linear actuating mechanism. 3,751,995, Cl. 74-20.000.

Carlson, Richard K.; and Koeber, Henry J., to Bell & Howell Company. Film footage indicator. 3,752,570, Cl. 352-172.000.

Carnaud, J. J., & Forges de Basse-Indre, S.A.: *See—*
Robert, Michel, 3,752,369.

Carpenter, Daniel D.; Develet, Jean A., Jr.; and Huang, Robert Y., to TRW Inc. Signal sorting system. 3,753,123, Cl. 325-476.000.

Carpentier, Jan Albert: *See—*
De Pauw, Alfons Josef; and Carpentier, Jan Albert, 3,752,672.

Carre, Jean-Claude: *See—*
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Carson, John Robert, to McNeil Laboratories, Inc. Aroyl-substituted pyrroles. 3,752,826, Cl. 260-326.300.

Cartier, Roger J.; Obermann, George; and Willigman, John, to Controls Company of America. Timer blade arrangement. 3,752,944, Cl. 200-38.00b.

Caruso, Jerome C., to Leira Corporation. Bulk film rewind apparatus. 3,752,413, Cl. 242-71.700.

Case, Melvin C.: *See—*
Shepard, Leonard F.; Durney, George P.; Case, Melvin C.; Kenneway, A. J., III; Wise, Robert C.; Rinehart, Dixie; Bessette, Ronald J.; and Pulling, Richard C., 3,751,727.

Casey, Gary L.; and Cogswell, James A., to General Motors Corporation. Method and apparatus for controlling a power transmission. 3,752,011, Cl. 74-731.000.

Cashau, George R.: *See—*
Hart, Charles H.; and Cashau, George R., 3,752,468.

Cassel, Ralph. Golf game equipment. 3,752,482, Cl. 273-176.00b.

Castegnier, Adrien. Electrolytic printing method and system. 3,752,746, Cl. 204-130.000.

Castille Cutting Dies, Inc.: *See—*
Castille, Gerald J., 3,752,042.

Castille, Gerald J., to Castille Cutting Dies, Inc. Adjustable die plate. 3,752,042, Cl. 93-58.20r.

Castle, Alfred B. Locking device. 3,751,949, Cl. 70-144.000.

Castonguay, Leon H., to Astratronics, Inc. Apparatus for slotting a clamping bushing by EDM. 3,752,950, Cl. 219-69.00v.

Castro, Salvador; and Schmalzbach, Edwin Lewis, to Hoffmann-La Roche Inc. Blood pressure cuff. 3,752,147, Cl. 128-20.50c.

Casull, Richard J. Cap and ball rifle. 3,751,840, Cl. 42-9.000.

Cataneo, Ferdinand: *See—*
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Caterpillar Tractor Company: *See—*
Anderson, Howard R., 3,751,907.
Bentz, Erwin J. H.; and Hiserote, Roger D., 3,752,132.
Stafford, Warren J., 3,752,509.

Cathers, George I.; and Shockley, William E., to United States of America, Atomic Energy Commission. Removal of organic and inorganic iodine from a gaseous atmosphere. 3,752,876, Cl. 423-240.000.

C.A.V. Limited: *See—*
Knight, Basil Edward; and Fenne, Ivor, 3,752,136.

Ceilcote Company, Inc., The: *See—*
Doyne, Richard F., 3,752,453.

Celanese Corporation: *See—*
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Jernigan, William Allen; Mims, Herman D.; and Clontz, Raeford W., 3,751,981.
Thompson, Darrell R.; and Ensley, Michael W., 3,752,782.
Vogt, Clifford M.; and Polise, Joseph C., 3,752,613.

Ceskoslovenska akademie ved: *See—*
Jost, Karel; Pliska, Vladimir; Krejci, Ivan; and Sorm, Frantisek, 3,752,799.

Chadha, Jaswinder Singh: *See—*
Aneja, Rajindra; and Chadha, Jaswinder Singh, 3,752,833.

Chamberlin, Richard I.; Leahy, Joseph E.; and Viles, Frederick J., to Sheldon, E. H., and Company. Laboratory exhaust hood. 3,752,056, Cl. 98-115.01h.

Chambers, John M.: *See—*
Windischman, Edward F.; Chambers, John M.; and Werner, Howard E., 3,752,510.

Champion International Chicago, Ill.: *See—*
Vassiliades, Anthony E.; Nauman, Edward F.; and Shroff, Shrenik, 3,752,698.

Champlin, Keith S.: *See—*
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Chana, Howard E. Automatic transmission and controls. 3,752,009, Cl. 74-645.000.

Chandrasekaran, R.: *See—*
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Chang, Nuke Ming: *See—*
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Chanlly, James L.: *See—*
Reeves, Billy Joe; and Chanlly, James L., 3,751,765.

Chapman, James D. Laser football first down measuring device. 3,752,588, Cl. 356-152.000.
Charbonnier, Roger, to Adret-Electronique. Active frequency meter. 3,753,100, Cl. 324-78.00d.
Charles, Ray E. Solid waste compactor operable on low pressure fluid. 3,752,066, Cl. 100-192.000.
Charlton, Donald A.; and Clark, William P. Microstrip ferrite phase shifters having line segment varying in length in accordance with preselected phase shift characteristic. 3,753,162, Cl. 333-24.100.
Charron, William W.; Harrison, Robert S.; and Marcum, Harold E., to Ford Motor Company. Vacuum controlled carburetor throttle valve positioner. 3,752,141, Cl. 123-198.0db.
Charron, William W.; Harrison, Robert S.; and Marcum, Harold E., to Ford Motor Company. Vacuum controlled carburetor throttle valve positioner. 3,752,450, Cl. 261-39.00r.
Chateau, Christian: *See—*
Burkhardt, Max; Huber, Horst; and Chateau, Christian, 3,752,219.
Cheek, Forrest R., to General Motors Corporation. Constant speed differential fluid clutch. 3,752,280, Cl. 192-85.0aa.
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Chemed Corporation: *See—*
Trombly, Michael E.; and Cowen, Samuel H., 3,751,729.
Chemical Instruments Corporation: *See—*
Schilling, Robert G., Jr., 3,751,977.
Chemiebau, Dr. A. Zieren, GmbH & Co., KG: *See—*
Sasse, Joachim, 3,752,884.
Chemische Fabrik Kalk GmbH.: *See—*
Lewer, Hans, 3,752,079.
Chen, James Y., to Monsanto Company. Mixer apparatus. 3,752,447, Cl. 259-10.000.
Chen, Philip M., to Westinghouse Electric Corporation. Mooring system. 3,752,106, Cl. 114-206.00r.
Chesler, Ronald Benjamin, to Bell Telephone Laboratories, Incorporated. Compact end-pumped solid-state laser. 3,753,145, Cl. 331-94.500.
Chester, Arthur W.; Kerr, George T.; Sherry, Howard S.; and Schweizer, Albert E., to Mobil Oil Corporation. Multimetalite catalysts. 3,752,776, Cl. 252-465.000.
Chevron Research Company: *See—*
Bacskai, Robert Kensington, 3,752,794.
Richardson, Wallace L., 3,752,657.
Seig, Robert P., 3,752,862.
Singer, Malcolm S., 3,752,890.
Unterberger, Robert R., 3,753,134.
Chiapella, Romano. Storey selector device for lifts. 3,752,264, Cl. 187-29.00r.
Chicago Bridge & Iron Company: *See—*
Sproul, David Douglas, 3,752,224.
Chieves, Eddie G.: *See—*
Brown, James A.; Chieves, Eddie G.; and Runyan, Wesley D., 3,752,314.
Chigirinsky, Alexandr Abramovich: *See—*
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Chiles, Seaborn Howard, to Chiles (Patents and Systems) Limited. Method of regulating and controlling speed and direction of electric motors and appliance. 3,753,065, Cl. 318-257.000.
Chilton, Gustavous W. Sod planting attachment. 3,752,238, Cl. 172-180.000.
Chisso Corporation: *See—*
Kaku, Kanji; Asaba, Mitsuo; Gondo, Yasaka; Kachi, Atsuyuki; and Matsumoto, Satoshi, 3,752,868.
Chlanda, Frederick P.; Gregor, Harry P.; and Liu, Kang-Jen, to Allied Chemical Corporation. Electrodialytic removal of acid from aqueous effluent. 3,752,749, Cl. 204-180.00p.
Chopra, Sohinder Nath: *See—*
Turmel, Hilaire Marcel; Lackie, Dorothy Ellen; and Chopra, Sohinder Nath, 3,751,777.
Chouings, Leslie Cyrie, to Automotive Products Company Limited. Fluid pressure braking systems. 3,752,266, Cl. 188-170.000.
Chromalloy American Corporation: *See—*
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Chu Associates, Inc.: *See—*
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Morgenthaler, Frederic R., 3,753,165.
Chulay, Steven J., to Beckman Instruments, Inc. Swinging bucket rotor assembly. 3,752,390, Cl. 233-26.000.
Chung, Kwang Chul. Shuttlecock or butterfly adjustable in range and speed. 3,752,479, Cl. 273-106.00a.
Churchill Machine Tool Company Limited, The: *See—*
Tittle, John Noel, 3,751,860.
Ciba-Geigy AG: *See—*
Diamantoglou, Michael; Adelliker, Hans Peter; Staub, Alfred; Bosshard, Hans; and Karlen, Urs, 3,752,831.
Hoelzle, Gerd; and Fasciati, Alfred, 3,752,801.
Ciba-Geigy Corporation: *See—*
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Varsanyi, Denis; and Roth, Willy, 3,752,811.
Ciecior, Heinrich, to Singer Company, The, mesne. Looper carrier bearing for chainstitch sewing machines. 3,752,101, Cl. 112-200.000.
Cincinnati Milacron Inc.: *See—*
Pilafidis, Emile J., 3,752,968.
Cincotta, John. Apparatus for removing oil from oil-contaminated water. 3,752,762, Cl. 210-32.000.
Ciribelli, Giorgio. Equipment for milking. 3,752,122, Cl. 119-14.040.
Cities Service Company: *See—*
Dotson, Anderson O., Jr.; and Olechowskil, Jerome Robert, 3,752,852.
Claar, Ethamore F.: *See—*
Oaks, Seibert S.; and Claar, Ethamore F., 3,752,515.
Claiborne, Jefferson L., to Dixie Yarns, Inc. Pressure relief system for dyeing apparatus. 3,751,946, Cl. 68-12.00r.
Clapper, Steven L., to Motorola, Inc. Resettable binary flip-flop of the semiconductor type. 3,753,009, Cl. 307-279.000.
Clark, Douglas Copeland: *See—*
Pinkham, Jesse Randolph; Clark, Douglas Copeland; and Wilkinson, Donald Ross, 3,752,337.
Clark Equipment Company: *See—*
Stevens, Daryl, 3,752,248.
Clark, Harold C. Oil well slip handle with rotatable components. 3,751,773, Cl. 24-263.0ha.
Clark, James A., to Clark Mobilizer, Inc. Therapeutic vibrating machine. 3,752,154, Cl. 128-33.000.
Clark, Jim W. Automobile tape cartridge dispensing case. 3,752,551, Cl. 312-245.000.
Clark, John M., Jr.: *See—*
Wood, Charles D., III; and Clark, John M., Jr., 3,752,240.
Clark Mobilizer, Inc.: *See—*
Clark, James A., 3,752,154.
Clark, Peter Stanley; and Hobbins, David William, to Foseco Trading A.G. Fibre containing compositions. 3,752,721, Cl. 156-148.000.
Clark, Samuel S.: *See—*
Morris, William A.; and Clark, Samuel S., 3,752,181.
Clark, William P.: *See—*
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Clarke, Edwin E.; and Florig, Albert J., said Clark, assor. to Bulk Liner Corporation. Bulk material handling system. 3,752,344, Cl. 214-508.000.
Classe, Anthony V.; and Mehn, Robert P., to Maryland Plastics Incorporated. Animal cage. 3,752,123, Cl. 119-17.000.
Clevite Corporation: *See—*
Wight, George W., Jr., 3,752,462.
Clishlm, Thomas A.; Duerr, Francis R.; and Olympia, Frederick D., to Corhart Refractories Company. Electric melting furnace and process of using it. 3,752,895, Cl. 13-10.000.
Clontz, Raeford W.: *See—*
Jernigan, William Allen; Mims, Herman D.; and Clontz, Raeford W., 3,751,981.
Close, Ernest Frederick, to Magnavox Company, The. Digital tuning indicator. 3,753,119, Cl. 325-455.000.
Coastal Dynamics Corporation: *See—*
Baker, Myron Lewis; and Myers, Lewis William, 3,752,974.
Coates, Ronald Bell, to Imperial Chemical Industries Limited. Process for melt spinning. 3,752,874, Cl. 264-176.00f.
Coen Company, Inc.: *See—*
Vosper, Ralph R.; Kirchner, Harry W., Jr.; and Hull, Guilford C., 3,752,405.
Coffman, Oscar D.: *See—*
Coffman, Oscar D.; and Reichner, Thomas W. (said Reichner assor. to said), 3,752,200.
Coffman, Oscar D.; and Reichner, Thomas W., said Reichner assor. to said Coffman, Oscar D. Powered hand tool. 3,752,200, Cl. 144-1.00e.
Cogswell, James A.: *See—*
Casey, Gary L.; and Cogswell, James A., 3,752,011.
Cohen, Marvin P.: *See—*
Von Strandimann, Max; Cohen, Marvin P.; and Shavel, John, Jr., 3,752,830.
Cohen, Peter J.; and Ackerman, Philip W., to Databit Incorporated. Bit regeneration for time division multiplexers. 3,752,933, Cl. 179-15.0ba.
Cohn, Seymour B., to United States of America, Army. Slot line. 3,753,167, Cl. 333-73.00r.
Colab Laboratories, Inc.: *See—*
Henshilwood, Jack R., 3,752,743.
Colburn, Richard L., to Fansteel Inc. Extensible lift mechanism. 3,752,331, Cl. 214-1.00a.
Colby, Harold S.: *See—*
Kingsbury, Charles M.; and Colby, Harold S., 3,751,902.
Coleman, Mary E. Bath room mouth wash dispenser. 3,752,365, Cl. 222-181.000.
Colgate-Palmolive Company: *See—*
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Collado, Ernest E.: *See—*
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Collazuol, Mario: *See—*
Di Salvo, Salvatore; and Collazuol, Mario, 3,752,976.
Collins, John Joseph, to Union Carbide Corporation. Bulk separation of carbon dioxide from natural gas. 3,751,878, Cl. 55-58.000.
Columbia Gas System Service Corporation: *See—*
Eberle, Arthur C., 3,753,108.

Colwell, Gene T.; and Jackson, Thomas W., to Georgia Tech Research Institute. Turbine-compressor. 3,751,908, Cl. 60-39.430.

Combustion Engineering, Inc.: *See—*
Musick, Charles R.; and Remshaw, Richard P., 3,752,735.
Roberts, James C., Jr.; and Nelson, Hersey B., 3,751,783.

Commissariat a l'Energie Atomique: *See—*
Bermann, Francis; Courtaud, Paul; Dioux, Claude; Manifacier, Andre; Raboeuf, Andre; and Ruffet, Pierre, 3,752,985.
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Compagnie des Lampes: *See—*
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Compagnie Generale d'Electricite: *See—*
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Compton, Ell Dee: *See—*
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Concast AG: *See—*
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Concast Incorporated: *See—*
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Concorde Fibers, Inc.: *See—*
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Condamatic Company, Inc.: *See—*
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Condon, Harry F., to Vaco Products Company. Hand fastener driving tool. 3,752,202, Cl. 145-61.001.

Condon, Joseph Henry, to Bell Telephone Laboratories, Incorporated. Bandpass filter using plural commutating capacitor units. 3,753,169, Cl. 333-70.00a.

Connor, Denis John; Lims, John Ormond; and Walsh, Kenneth Allen, to Bell Telephone Laboratories, Incorporated. Conditional replenishment video encoder with low-frequency compensation. 3,752,913, Cl. 178-6.000.

Container Corporation of America: *See—*
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Continental Tapes, Incorporated: *See—*
Dahl, Rolf, 3,752,700.

Controls Company of America: *See—*
Cartier, Roger J.; Obermann, George; and Willigman, John, 3,752,944.

Conzinc Riotinto of Australia, Limited: *See—*
Worner, Howard Knox; and Siddons, Ronald, 3,752,663.

Cook, Robert G., Sr.: *See—*
Waizmann, George H.; and Cook, Robert G., Sr., 3,752,028.

Cooke, Anson R.; Jacobs, Richard L.; and Compton, Ell Dee, to Sherwin-Williams, The, mesne. Certain 3-substituted-pyrido (3,2-d) pyrimidine 2,4-(lH, 3H) diones. 3,752,816, Cl. 260-256.40f.

Cooke, Harry F., to Texas Instruments, Incorporated. Microwave semiconductor device. 3,753,056, Cl. 317-234.00r.

Coombs, William Charles. Powered winches. 3,752,442, Cl. 254-185.00r.

Cooper, Edward N. K.: *See—*
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Cooper, Joseph: *See—*
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Copeland, Doris E. Head stand exerciser. 3,752,153, Cl. 128-24.00r.

Copley, Stephen M.; and Giamei, Anthony F., to United Aircraft Corporation. Mold apparatus for casting with downward unidirectional solidification. 3,752,221, Cl. 164-338.000.

Coran, Aubert Yaucher; and Kerwood, Joseph Edward, to Monsanto Company. Thioamides. 3,752,824, Cl. 260-326.00s.

Corbett, John M.; and Fookes, James L., to Dow Chemical Company, The. Foam scrap recovery and apparatus. 3,752,631, Cl. 425-324.000.

Corbett, Joseph H.: *See—*
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Corhart Refractories Company: *See—*
Clishim, Thomas A.; Duerr, Francis R.; and Olympia, Frederick D., 3,752,895.

Cornelius, Thomas Edward, III: *See—*
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Corning Glass Works: *See—*
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Cosden Oil & Chemical Company: *See—*
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Cottbell, Harold E. Hydraulic transmission. 3,751,922, Cl. 60-349.000.

Coulter Electronics, Inc.: *See—*
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Coupland, John Robert: *See—*
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Courtois, Monique; and Ores, Bernard. Extraction of protlases. 3,752,741, Cl. 195-66.00r.

Cowen, Samuel H.: *See—*
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Cox & Wright Limited: *See—*
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Cox, Gordon Cavell, to Cox & Wright Limited. Dies for high frequency welding and cutting. 3,752,727, Cl. 156-510.000.

Cozza, Giorgio; Scaglia, Carlo; and Barilli, Filippo, to Societa Italiana Resine S.p.A. Process for manufacturing sodium phosphates. 3,752,879, Cl. 423-315.000.

Cozzarin, Virgil J.: *See—*
Kipple, Harry P.; Cozzarin, Virgil J.; and Kapperman, Francis C., 3,752,116.

Cozzy, Thomas William; and Pettinga, Robert, to General Electric Company. Auto-synchronizing gear system. 3,752,035, Cl. 89-13.00r.

Crabb, Donald Eugene: *See—*
Johnson, Erlon Fitch; and Crabb, Donald Eugene, 3,753,216.

Crane, Edward J., to International Agri-Systems, Inc. Poultry picking finger support. 3,751,763, Cl. 17-11.10r.

Craven, Herman R.; Baxendale, John W.; and Hunter, Charley W., to Vendo Company, The. Selective dispensing apparatus for bottled products or the like. 3,752,360, Cl. 221-125.000.

Crawfish Boat Company, Inc.: *See—*
Meynier, Maurice J., Jr., 3,752,111.

Crawford, Arthur R.; Barnett, Glenroy W.; Porter, Richard E.; and Pottebaum, Joseph R., to Production Measurements. Average timing method and apparatus for internal combustion engines. 3,753,082, Cl. 324-16.00r.

Crawford, Charles Kenneth. Vehicle motor block tester and method of using the same. 3,751,978, Cl. 73-49.700.

Crawford, Howard H. Slide caliper. 3,751,814, Cl. 33-143.00m.

Crawford, Robert H., to Texas Instruments, Incorporated. High speed, low power, dynamic shift register with synchronous logic gates. 3,753,006, Cl. 307-214.000.

Creative Engineering Limited: *See—*
Lyons, John Alexander, 3,751,863.

Crist, Elmer E., to Beloit Corporation. Web dryer. 3,751,822, Cl. 34-116.000.

Cross, Norman A., to General Motors Corporation. Power transmission having a hydrostatic drive combined with a hydrodynamic drive. 3,752,013, Cl. 74-732.000.

Crouch, Willie W.; and Williams, Ralph P., to Phillips Petroleum Company. (Alkylthio) alkyl mercaptans as gas odorants. 3,752,659, Cl. 48-197.0fm.

Crystal-Protronics Associates: *See—*
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Csatlos, Geza M., to Karg Machine Products, Inc. Work holding device. 3,752,464, Cl. 269-32.000.

CSF-Compagnie Generale de Telegraphie Sans Fil: *See—*
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Culbertson Industries, Inc.: *See—*
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Cullum, Troy, to Polyvend, Inc. Price selection vending machine arrangement. 3,752,287, Cl. 194-10.000.

Culver, Clyde C., to General Motors Corporation. Occupant restraint system. 3,752,500, Cl. 280-150.0ab.

Culver, Richard B., to Dresser Industries, Inc. Circuit for reducing pulse pile-up in pulse detection systems. 3,752,988, Cl. 250-270.000.

Curle, Wilfred Roy: *See—*
Hawker, Collin John; Curle, Wilfred Roy; and Read, Harold David, 3,753,044.

Curtis, Helene, Industries, Inc.: *See—*
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Custom Electronic Devices, Inc.: *See—*
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Cvacho, Daniel S.; and Wallace, Joseph W., to Reynolds Metals Company. Method and apparatus for making a drawn article. 3,751,962, Cl. 72-347.000.

Cybertek, Inc.: *See—*
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Daedalus Enterprises, Inc.: *See—*
England, George; and Warner, Dwight Allen, 3,752,914.
Parker, Alan Keith; and Warner, Dwight Allen, 3,752,915.

Dahl, Rolf, to Continental Tapes, Incorporated. Method of impregnating paper. 3,752,700, Cl. 117-155.00r.

Daiichi Seiyaku Company Limited: *See—*
Watanabe, Motoyasu, 3,752,115.

Daikin Kogyo Kabushiki Kaisha: *See—*
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Daimler-Benz Aktiengesellschaft: *See—*
Enke, Kurt; Bauer, Klaus; and Saftien, Udo, 3,752,497.
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Dakss, Mark L.: *See—*
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D'Alo, Bruno: *See—*
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Dana Corporation: *See—*
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Sink, William Howard, 3,752,286.

Danfoss A/S: *See—*
Hansen, Gunnar Lyshoj; and Rono-Clausen, Jorgen, 3,752,602.

Daniel, Roger P.; and Rhodes, Alex, to Ford Motor Company. Steering wheel inflatable cushion device. 3,752,501, Cl. 280-150.0ab.

Daniels, Dale L.; and Purnival, Thomas J., to General Motors Corporation. Method of fabricating a semiconductor enclosure. 3,751,800, Cl. 29-589.000.

Danik, Michael J., to General Motors Corporation. Cable length adjuster. 3,752,008, Cl. 74-501.00r.

Dare Products, Incorporated: *See—*
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Dart Industries, Inc.: *See—*
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Daspit, Walter J., to Submarine Pipeline Technology Inc. Method and device for detecting faults in nonconductive coatings on under water pipelines. 3,753,091, Cl. 324-54.000.

Data-Plex Systems, Inc.: *See—*
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Daughton, James M.; Tomczak, James J.; and Wiedman, Francis W., III, to International Business Machines Corporation. Monolithic memory module redundancy scheme using prewired substrates. 3,753,235, Cl. 340-172.500.

Daussan, Henri-Jean. Ingot-molds comprising ingot insulating means. 3,752,435, Cl. 249-106.000.

Davenport, Andrew J.: *See—*
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Davenport, Richard L., to Johnson, S. C., & Son, Inc. Shutter-type valve mechanism. 3,752,370, Cl. 222-514.000.

David Brown Gear Industries Limited: *See—*
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Davidson, Arthur C.; and Grant, McLean M., to United States of America, National Aeronautics and Space Administration. Spacecraft altitude sensor. 3,752,993, Cl. 250-203.00r.

Davies, Derek. Toboggan. 3,752,492, Cl. 280-18.000.

Davis, Donald L., to Woodward Governor Company. Magnetic ball head speed governor. 3,751,993, Cl. 73-518.000.

Davis, Harry T., to Hood Sailmakers, Inc. Attachment point on the corner of a fabric sheet. 3,751,793, Cl. 29-523.000.

Davis, Mike, to Dresser Industries, Inc. Acoustic well logging method and apparatus using pipe as an acoustic transmitter. 3,752,257, Cl. 181-.5ag.

Davis, Rooney W., to Sola Basic Industries, Inc. Adjustable fluorescent lamp mounting means. 3,752,977, Cl. 240-51.120.

Davis, Willard F.: *See—*
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De Brunner, Marjorie Ruth, to Du Pont de Nemours, E. I., and Company. Fluoroelastomer composition containing a triarylphosphorane vulcanization accelerator. 3,752,787, Cl. 260-41.00b.

De Fevere, Dennis: *See—*
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De La Celle, Guy Etienne. Tape recorder controlling device. 3,752,487, Cl. 274-4.00a.

De Napoli, Robert A.: *See—*
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De Pauw, Alfons Josef; and Carpentier, Jan Albert, to Gevaert-Agfa N.V. Method of incorporating ingredients in hydrophilic colloids. 3,752,672, Cl. 96-100.000.

De Ramis, Angelika Zankl: *See—*
Arlt, Dieter; Bertram, Hans-Herwig; Pedain, Josef; Zankl, Erich; Zankl, Walter; and De Ramis, Angelika Zankl, 3,752,793.

De Tartaglia, Peter, to Motoren- und Turbinen-Union Munchen GmbH. Air inlet arrangement for gas turbine engine combustion chamber. 3,751,911, Cl. 60-39.650.

de Vleesschauwer, Walter Ferdinand, to S.A. Texaco Belgium N.V. Method and apparatus for measurement of minute quantities of oxygen. 3,752,652, Cl. 23-232.00e.

De Vries, Adrian J., to Zenith Radio Corporation. Acoustic surface wave filter. 3,753,164, Cl. 333-30.00r.

De Vries, Robert. Container for ice cream. 3,752,364, Cl. 222-131.000.

Dear, Robert E. A.: *See—*
Oxenrider, Bryce C.; Woolf, Cyril; Dear, Robert E. A.; and Beyleveld, Wilhelmus M., 3,752,840.

Decision Consultants: *See—*
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Decitre, Pierre, to Houilleres du Bassin du Nord & du Pas-de-Calais. Apparatus for the production of solidified trioxan. 3,752,624, Cl. 425-224.000.

Deepsea Ventures, Inc.: *See—*
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Degginger, Edward R.; and Stealman, Thomas R., to Allied Chemical Corporation. Fire fighting system. 3,752,234, Cl. 169-1.00a.

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Demirag, Galip. Convertible transporting device. 3,752,354, Cl. 220-63.00r.

Dems, Peter, to Signode Corporation. Feed mechanism. 3,752,058, Cl. 100-32.000.

Demurger, Jacques L. J., to Etablissements Demurger & Cie. Sawing method and machine. 3,752,022, Cl. 83-13.000.

den Herder, Johannes; and den Herder, Pieter Willem, to Gebraeders den Herder, Firma. Devices for mechanically clearing waterways, particularly ditches. 3,751,887, Cl. 56-8.000.

den Herder, Pieter Willem: *See—*
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Denbnovetsky, Stanislav Vladimirovich; Kovtun, Alexandr Karpovich; and Sigorsky, Vitaly Petrovich. Method for measuring time intervals and apparatus. 3,753,111, Cl. 324-187.000.

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DeRouen, Ray J.; Tuggle, Ray; and Graves, Richard H., to Texaco, Inc. Liquid separation apparatus. 3,752,318, Cl. 210-251.000.

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Deutsch, Peter R., to Phillips Petroleum Company. Apparatus for molding articles having a nonlinear chamber. 3,752,436, Cl. 249-145.000.

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Dhein, Rolf; Schnell, Hermann; and Raichle, Karl, to Bayer Aktiengesellschaft. "Water-dilutable" alkyd resins modified by radicals of drying fatty acids. 3,752,778, Cl. 260-22.0tn.

Di Padova, Sergio; and Musso, Pietro, to Olivetti, Ing. C., & C., S.p.A. Interchangeable endless loop magnetic tape cartridges. 3,752,379, Cl. 226-119.000.

Di Salvo, Salvatore; and Collazuol, Mario, to Fiat Societa per Azioni. Device for varying the directional setting of motor vehicle headlamps. 3,752,976, Cl. 240-41.600.

Di Veto, Hilliard R., to Burroughs Corporation. Transducing apparatus for scanning data recordable magnetic stripes. 3,753,255, Cl. 340-174.10m.

Diamantoglou, Michael; Adelliker, Hans Peter; Staub, Alfred; Bosshard, Hans; and Karlen, Urs, to Ciba-Geigy AG. Anthraquinone dyestuffs. 3,752,831, Cl. 260-376.000.

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Dickason, Richard T.; Ray, Donald J.; and Simmons, Charles D., to Ford Motor Company. Motor vehicle electrically heated windshield and backlight system. 3,752,348, Cl. 219-203.000.

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Dixon, Allen L., to Master-Craft Corporation. Sheet holder. 3,752,504, Cl. 282-29.00b.
Dixon, Harry E. Device for indicating slope of green on golf course. 3,751,819, Cl. 33-389.000.
Dixon, Richard Wayne; Ralston, James Michael; and Rosenzweig, Walter, to Bell Telephone Laboratories, Incorporated. Apparatus for measuring electroluminescent device parameters. 3,752,980, Cl. 250-552.000.
Doane, Russell C.: *See—*
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Dryden, Gale E., to Dryden Corporation. Venting device and method for anesthetic administration. 3,752,186, Cl. 137-608.000.
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Ehrich, Felix Frederick; and Jaffe, Edward E., to Du Pont de Nemours, E. I., and Company. 2,9-Dicarboxyquinacridone and methods for its production. 3,752,817, Cl. 260-279.00r.
Eichinger, Hans, to Schottel-Werft Josef Becker KG. Rudder propeller for ships and amphibian vehicles. 3,752,112, Cl. 115-35.000.
El-Hindi, Ahmad M.; and Jaeggli, Ralph G. Method of separating solids from liquids. 3,752,758, Cl. 210-21.000.
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Eller, Kyle Clifton, Jr. Instrument for checking and determining the grade and slope of a surface. 3,751,818, Cl. 33-375.000.

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Enke, Kurt; Bauer, Klaus; and Saftien, Udo, to Daimler-Benz Aktiengesellschaft. Installation for stabilizing the vehicle body against curve-tilting. 3,752,497, Cl. 280-112.00a.

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Ettelman, David J., to Multi-Amp Corporation. Device for testing the adequacy of electrical circuit such as the ground circuit of an extension cord. 3,753,088, Cl. 324-51.000.

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Everest, Frank Geoffrey; and Veasey, Thomas Patrick, to British Aircraft Corporation Limited. Rangefinder. 3,752,581, Cl. 356-5.000.

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Ezra, Arthur A.; Howell, William G.; Glick, Herbert S.; and Kaplan, Michael A., to Denver Research Institute. Method and apparatus for explosive autofrettage. 3,751,954, Cl. 72-56.000.

Fabri-Kal Corporation: *See—*
Schrepper, Gerald A., 3,751,852.

Fabricant, Norman. Pneumatic board game apparatus. 3,752,481, Cl. 273-131.0ba.

Fabriques de Produits Chimiques de Thann et de Mulhouse: *See—*
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Faggin, Federico, to Intel Corporation. Power supply settable bi-stable circuit. 3,753,011, Cl. 307-247.00r.

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Falkiner-Muttall, George Robert, to Tracked Hovercraft Limited. Electric current collector arrangements. 3,752,274, Cl. 191-49.000.

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Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning: *See—*
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Faust, Delbert G., to Norgren, C. A., Co. Bowl guard connector. 3,752,508, Cl. 285-307.000.

Favre, Henri Victor. Method of making bezels for setting precious stones. 3,751,795, Cl. 29-558.000.

Fayling, Richard E., to Minnesota Mining and Manufacturing Company. System to determine the directional mode of travel of vehicles on a roadway. 3,753,223, Cl. 340-32.000.

Federal-Mogul Corporation: *See—*
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Fegley, Donald R.; Khalil, Sobhy T.; Lrick, Carl M.; and Nypaver, Leonard P., to Van Dorn Plastic Machinery Company. Control for injection molding machine. 3,752,363, Cl. 222-63.000.

Feistel, Karl Heinz, to Goltermann, Wandel U. Equalizing network. 3,753,140, Cl. 335-109.000.

Fekete, Imre, to Thomas & Betts Corporation. Semi-automatic tying and cutting tool for harnessing and wire bundling. 3,752,199, Cl. 140-123.600.

Feldman, Sidney, to United States of America, Navy. Sextant with digital readout and night viewing capability. 3,752,591, Cl. 356-247.000.

Fend, Fritz M., to Marker, Hannes. Safety ski binding system. 3,752,491, Cl. 280-11.35k.

Fenne, Ivor: *See—*
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Fernandez, Manuel: *See—*
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Ferneau, Richard H.; and Bourgraf, Elroy E., to Weil, Burt. Multi-lever one man cart adapted to be moved up and down stairs. 3,752,527, Cl. 296-20.000.

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Fick, Robert L.; and Markey, Allen H., to Dow Chemical Company, The. Sampling device. 3,751,967, Cl. 173-23.000.

Fiddler, Theodore E. Self attaching coupling. 3,752,032, Cl. 85-80.000.

Fike, Robert R., to Dow Chemical Company, The. Polarographic electrode method. 3,752,744, Cl. 204-1.00t.

Finch, Kenneth W., to International Harvester Company. Air conditioning apparatus for automotive vehicles. 3,752,223, Cl. 165-43.000.

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Finke, Albert, to Allis-Chalmers Corporation. Pallet construction for increased density of loading. 3,752,087, Cl. 108-59.000.

Finley, John G.: *See*—
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Fiorentino, Arthur A.; and Mc Cree, Alan Collis, to Thomas & Betts Corporation. Harness board module. 3,752,198, Cl. 140-92.100.

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Fischer, Adolf: *See*—
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Fischer, Heimbert. X-ray device having an anode tube with filtering means thereon. 3,752,990, Cl. 250-503.000.

Fischer, Herbert: *See*—
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Fisher, Allen J., to International Harvester Company. Positive locking clutch shift mechanism. 3,752,283, Cl. 192-99.500.

Fisher, Glen W.; and Franz, Fred A., to Technovator, Inc. Particulate solid material inspection system. 3,751,991, Cl. 73-421.000.

Fisher, Raymond E.: *See*—
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Fisher, Robert D.; and Puram, George C., to Ferroxcube Corporation. Method of making a magnetic head. 3,751,803, Cl. 29-603.000.

Fitterer, George R. Method of fabricating a sensor for the determination of the oxygen content of liquid metals. 3,752,753, Cl. 204-175.00s.

Fitzgerald, Francis J., Jr.: *See*—
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Fitzgerald, Harold W.; and Gunther, Warren T. Plastic pipe reamer and method. 3,752,593, Cl. 408-1.000.

Flak, Peter R., to Quester Corporation. Racket frame. 3,752,478, Cl. 273-73.00h.

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Fleischmann, Horst: *See*—
Stosberg, Herbert; Fleischmann, Horst; Reinhards, Gunter; and Engels, Siegfried, 3,751,757.

Fletcher, Samuel G. Process and apparatus for determining the degree of nasality of human speech. 3,752,929, Cl. 179-1.0sa.

Flexogenics Inc.: *See*—
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Flickinger, Daniel N. Amplifier system utilizing regenerative and degenerative feedback to shape the frequency response. 3,752,928, Cl. 179-1.00a.

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Fluckiger, Edward; Troxler, Franz; and Hofmann, Albert, to Sandoz Ltd.; a/k/a Sandoz AG. 2-Bromo-α-ergocryptine. 3,752,814, Cl. 260-268.0pe.

Fluckiger, Edward; Troxler, Franz; and Hofman, Albert, to Sandoz Ltd.; a/k/a Sandoz AG. 2-Bromo-α-ergocryptine -ergocryptine as a lactation inhibitor. 3,752,888, Cl. 424-250.000.

Fluhr, Frederick R., to United States of America, Navy. Optical communication system. 3,752,992, Cl. 250-199.000.

Flynn, Richard Thomas; and Porter, Marion Gene, to Honeywell Information Systems Inc. Microprogrammable peripheral controller. 3,753,236, Cl. 340-172.500.

Foley, Gerard M.; and Mosley, Gerald, to Leeds & Northrup Company. Cathode ray tube system with strip chart recorder display format. 3,752,917, Cl. 178-6.800.

Food Equipment Inc.: *See*—
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Foseco International Limited: *See*—
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Foster, Clifford R. Changeable plow sweep. 3,752,236, Cl. 172-751.000.

Foster, Russell G., to Northrup, King & Co. Seed tape dispenser. 3,752,303, Cl. 206-52.00r.

Foucault, Pierre. Apparatus for mixing fluids. 3,752,444, Cl. 259-2.000.

Fouts, Robert E. Sealed fitting for reinforced hose. 3,752,506, Cl. 285-149.000.

Fowler, Richard L.: *See*—
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Foy, Fred P., Jr.; and Chang, Nuke Ming, to Santa Fe International Corporation. Drill bit utilization optimizer. 3,752,966, Cl. 235-150.100.

Frakes, Paul V., to Gazer Corporation, The. Method of forming a welded joint construction. 3,751,792, Cl. 29-471.100.

Frame, Wayne W. Rein manipulation training device. 3,751,828, Cl. 35-11.000.

Franck, Howard S., to Philco-Ford Corporation. Refrigerator cabinet construction. 3,752,350, Cl. 220-9.00g.

Frankel, Donald P.; and Peterson, Charles K., to LaMere Industries, Inc. Dry sanitary toilet. 3,752,090, Cl. 110-9.00r.

Franz, Fred A.: *See*—
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Frazier, Stanley J. Construction of a form for concrete molding. 3,751,790, Cl. 29-455.000.

Frederick, Oscar C.: *See*—
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Frederick, Ronald, to Desoutter Brothers Limited. Improved power operated wrench or screwdriver. 3,752,278, Cl. 192-56.00r.

Frederiksen, Thomas M.; Davis, William F.; and Russell, Ronald W., to Motorola, Inc. Circuit for providing precise time delay. 3,753,012, Cl. 307-293.000.

Freeman, Max. Resilient strip mounting for plastic bag fabricator. 3,752,725, Cl. 156-367.000.

Freeman, Raymond, to Varian Associates. Gyromagnetic resonance method and apparatus for obtaining spin-spin coupling constants. 3,753,081, Cl. 324-.50r.

Freimanis, Laimons, to Bell Telephone Laboratories, Incorporated. Telephone subscriber line ring-trip detection circuit. 3,752,924, Cl. 179-84.00r.

Frey, William G., to Thomas & Betts Corporation. Method and means for connecting to a metallically sheathed cable. 3,753,213, Cl. 339-97.00r.

Friedman, Leonard: *See*—
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Frisch, Erling; and Andrews, Harry N., to Westinghouse Electric Corporation. Combination of nuclear reactor and missile shield. 3,752,737, Cl. 176-38.000.

Frisch, Peter: *See*—
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Frischbier, Klaus. Concentrating krypton and xenon in air separation by liquid oxygen wash. 3,751,934, Cl. 62-41.000.

Frisone, John Batista, to International Business Machines Corporation. Loop communications system. 3,752,932, Cl. 179-15.0al.

Fritsche, Gale Ray, to Sandel Industries, Inc. Apparatus for homogeneous refining and continuously casting metals and alloys. 3,752,216, Cl. 164-252.000.

Fritzinger, Dale A.; and Newman, Robert H., to General Electric Company. Sync pulse defeat switch. 3,752,909, Cl. 178-7.30r.

Froehlig, Rudolph A., to Modern Album and Finishing Co., Inc. Package construction. 3,752,386, Cl. 229-32.000.

Frost, Charles C.; Shaw, Thomas E.; and Weiss, Siegfried K., to Frost Engineered Products, Inc. Method for finishing anti-friction bearings. 3,751,861, Cl. 51-316.000.

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Frost, William B.; and Cooper, Edward N. K. Indicia display. 3,751,836, Cl. 40-64.000.

Fruish, Harvey, to Herbert, Alfred, Limited. Throw away tips for metal cutting tools. 3,751,782, Cl. 29-95.00r.
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Fryer, Thomas B., to United States of America, National Aeronautics and Space Administration. Low power electromagnetic flowmeter providing accurate zero set. 3,751,980, Cl. 73-194.0em.
Fuchs, Julius J., to Du Pont de Nemours, E. I., and Company. Process for the preparation of carbamates of alkylthiolhydroxamates and intermediates. 3,752,841, Cl. 260-453.00r.
Fuchs, Otto; Deubel, Rheinhold; and Weide, Joachim, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process for wet grinding of pigments in aqueous alkaline medium. 3,752,688, Cl. 106-309.000.
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Furuishi, Haruhisa; Iida, Yasunobu; and Fukuoka, Toshiaki, to Matsushita Electric Industrial Co., Ltd. Ohmmeter for measuring the internal resistance of a battery and directly reading the measured resistance value. 3,753,094, Cl. 324-29.500.
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Gabriel, George S., to Lab Products, Inc. Watering bottle assembly for animals. 3,752,124, Cl. 119-72.500.
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Gaines, John W., to International Harvester Company. Engine injection pump operating all cylinders or less. 3,752,138, Cl. 123-139.00r.
Gallucci, Francis; and Slamar, Frank, to United States Steel Corporation. Method for controlling forces on a strand as it solidifies. 3,752,210, Cl. 164-82.000.
Gamble, Peter Charles David; and Marsh, John, to Ashmore, Benson Pease & Company Limited. Continuous casting moulds. 3,752,218, Cl. 164-281.000.
Garcea, Giampaolo, to Alfa Romeo S.p.A. Exhaust chamber for a motor vehicle provided with an internal combustion engine. 3,751,917, Cl. 60-288.000.
Gardner, Leslie William; Helbren, Nicholas James; and Stewart, Duncan, to Fulmer Research Institute Limited. Method and equipment for the determination of the degree of abrasiveness of magnetic tape. 3,753,093, Cl. 324-65.00r.
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Gelenius, Robert B.; and Levijoki, Wayne A., to General Motors Corporation. Combined wheel slip limiting and vehicle speed limiting apparatus. 3,752,249, Cl. 180-82.00r.
Gemperle, Bruno, to Anstalt Europaische Handelsgesellschaft, mesne. Apparatus for enciphering and deciphering multidigit coded signals. 3,752,920, Cl. 178-22.000.
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Gilb, Tyrell T., to Simpson Company. Single-thickness seat hanger. 3,752,512, Cl. 287-20.940.
Gilberg, Robert C.; Donohue, James P.; and Patel, Ramesh S., to National Cash Register Company, The. Field detecting logic. 3,752,958, Cl. 235-61.11e.
Gilbert, Edward O.; Gilbert, Elmer G.; Fadden, Edward J.; and Berge, Thomas D., to Reliance Electric Company. Multicomputer system with simultaneous data interchange between computer. 3,753,234, Cl. 340-172.500.
Gilbert, Elmer G.: *See—*
Gilbert, Edward O.; Gilbert, Elmer G.; Fadden, Edward J.; and Berge, Thomas D., 3,753,234.
Gilbert, Evalin S. Upholstered seat. 3,752,533, Cl. 297-445.000.
Gill, Bernard, to Kiwi Coders Corporation. Article controlled rotary marking apparatus. 3,752,067, Cl. 337-17.000.
Gillemot, George W.: *See—*
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Gillette, Dean; and Pelech, Ivan, to Bell Telephone Laboratories, Incorporated. Crosspoint switch utilizing electrically conducting liquid. 3,753,175, Cl. 335-47.000.
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Glazunov, Sergei Georgievich; Khrustsevich, Leonid Alexandrovich; and Altunin, Yury Fedorovich. Device for producing fine powder of liquid metal. 3,752,610, Cl. 425-6.000.
Gleason, Harold T.: *See—*
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Goldberg, Abraham A. Electrically remote controlled device attachable to switch box face plate for alternately actuating and deactuating the switch. 3,753,173, Cl. 335-1.000.
Golde, Michael. Document destruction and baling machine. 3,752,063, Cl. 100-97.000.
Goldfarb, Adolph E.: *See—*
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Goldfarb, Adolph E.; and Fernandez, Manuel, said Fernandez assor. to said Goldfarb, Adolph E. Stacking toy. 3,751,849, Cl. 46-40.000.
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Golovko, Georgy Anatolievich: *See—*
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Goodhue, William V.; and Pitts, Thomas E., to Leesona Corporation. Strand detection. 3,751,893, Cl. 57-34.00r.
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Gordon, Larry; and Paskow, Larry J. Surveillance camera. 3,752,047, Cl. 95-11.000.
Gordon, Robert Cornelius, Jr.; Walker, Jerry Lee; Sharpe, Andrew Jackson, Jr.; and Boothe, Jerry Emile, to Calgon Corporation. Silt removal. 3,752,760, Cl. 210-58.000.
Gordon, Wolfgang; Rust, Kurt; and Schrott, Erwin, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Mixed catalyst for the polymerization of α-olefins. 3,752,797, Cl. 260-93.700.
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Gower, Roger L. Chain assembly for improving traction of automotive vehicles. 3,752,205, Cl. 152-243.000.
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Graetz, Ernest F. J., to Parke Davis & Company. Manual set system for shift register. 3,753,124, Cl. 328-37.000.
Graf, Arthur. Stapling machine for making electrical connections and other fastenings. 3,751,961, Cl. 72-339.000.
Graf, Carlton Eugene, to General Electric Company. Stabilizing means for an A-C motor drive. 3,753,063, Cl. 318-227.000.
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Grahn, Robert D., to Sunbeam Corporation. Hedge trimmer. 3,751,805, Cl. 30-220.000.
Grandjanny, Charles. Terminal gripping device for elastic cord. 3,751,772, Cl. 24-126.00c.
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Greenwell, Jack E., to Lear Motors Corporation. Induction motor system for traction. 3,753,060, Cl. 318-227.000.
Greenwell, Jack E., to Lear Motors Corporation. Polyphase motor system with DC motor characteristics. 3,753,062, Cl. 318-225.00r.
Gregor, Harry P.: *See—*
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Greskovics, Paul, to Western Data Products, Inc., mesne. Magnetic card handling system. 3,752,962, Cl. 235-61.11d.
Gridley, James Robert. Push-button door lock. 3,751,951, Cl. 70-313.000.
Grier, John D.; and Camp, Harold E. Visual data handling systems. 3,752,994, Cl. 250-213.00r.
Griffith, James R., to United States of America, Navy. Polymers of 2-(fluorophenyl)-hexafluoro-2-propyl gylcidyl ether. 3,752,777, Cl. 260-2.00a.
Griffith, John Dalton, to Bonas Machine Company, Limited. Loom shelding mechanism. 3,752,194, Cl. 139-79.000.
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Griswold, David E., to Griswold Controls. Flow control valve. 3,752,184, Cl. 137-504.000.

Groen, Frederick H., Jr., to Dover Corporation. Portable scraper-type mixer. 3,752,057, Cl. 99-348.000.

Grosjean, Pierre; Guillermin, Rene; and Vidal, Roger, to Societe Rhodiaceta. Process for the simultaneous texturizing and dyeing or finishing of thermoplastic yarns. 3,751,778, Cl. 28-72.140.

Gross, Alan E., to MTS Systems Corporation. Oscillatory signal system with turn on and turn off rate control. 3,751,994, Cl. 73-67.300.

Grossetete, Roger; and Blaublomme, Jean Pierre, to Etablissements Andre Debris. Light-correction system for printers of colour cinematographic films. 3,752,577, Cl. 355-36.000.

Grove, Lawrence L., to General Electric Company. Electric oven toaster control mechanism. 3,752,955, Cl. 219-413.000.

Grove, Leroy K. Electromagnet bobbin structure for vehicle brakes containing an abrasive wear surface. 3,753,182, Cl. 335-281.000.

Grove, Marvin H.; and Karr, Michael A., Jr., to M & J Valve Company. Valve construction. 3,752,178, Cl. 137-246.220.

Grunert, Kurt A.; and Dauer, John J., Jr., to Westinghouse Electric Corporation. Electric control device. 3,753,177, Cl. 335-132.000.

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Guarnaschelli, Gianpiero, to Honeywell Information Systems Italia. Memory pre-driver circuit. 3,753,008, Cl. 307-270.000.

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Gunn, John B.; and Staples, John L., to International Business Machines Corporation. Electronic switching transient detector and method for locating electrical power supply noise sources. 3,753,089, Cl. 324-52.000.

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Hackett, Richard L. Rudder construction for sailboats. 3,752,105, Cl. 114-162.000.

Hafele, Robert X.; and Robertson, Elmer L., to Ethyl Development Corporation. Apparatus for molding plastic containers. 3,752,628, Cl. 425-302.00b.

Hagenbach, Robert J.; and Madrid, Robert W., to Xerox Corporation. Electrostatic imaging process using carrier beads containing conductive particles. 3,752,666, Cl. 96-1.000.

Hahn, Granville J., to Cosden Oil & Chemical Company. Titanium dioxide mixing. 3,752,687, Cl. 106-300.000.

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Hammelmann, Paul. Spraying apparatus. 3,752,117, Cl. 118-302.000.

Hanna, Chester H.; and Igou, Richard A. Deer dragging and tagging device. 3,752,525, Cl. 294-74.000.

Hannaway, John H., to Mount Hope Machine Company, Incorporated. Apparatus for correcting weft distortions in woven webs. 3,751,774, Cl. 26-51.400.

Hansen, Fritz Ernst, to Multitec A.G. Drying apparatus. 3,751,823, Cl. 34-155.000.

Hansen, Gunnar Lyshoj; and Rono-Clausen, Jorgen, to Danfoss A/S. Oil pump for heating installations. 3,752,602, Cl. 417-310.000.

Hanssen & Cie S.A.: *See—*
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Haraikawa, Tetsuo, to Tokico Limited. Dual network hydraulic brake system. 3,752,271, Cl. 188-345.000.

Haraikawa, Tetsuo, to Tokico Limited. Dual hydraulic brake system. 3,752,273, Cl. 188-345.000.

Haraszti, Tegze, to Licentia Patent-Verwaltungs-G.m.b.H. Electric dynamically operated storage element. 3,753,010, Cl. 307-279.000.

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Hardesty, Donald L. Switch testing apparatus. 3,753,083, Cl. 324-28.000.

Hardy, John W., to Itek Corporation. Stereo instrument having differentially varied left and right parallax error signals for producing scanning pattern displacements. 3,752,580, Cl. 356-2.000.

Harima Refractories Co., Ltd.: *See—*
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Harllee, Gloria C.; and Woods, John D. Smoke filter plug and process and cigarette made therefrom. 3,752,165, Cl. 131-10.500.

Harmon, Shepard Lewis, to Owens-Illinois, Inc. Cap sorting apparatus. 3,752,294, Cl. 198-33.0aa.

Harrell, Jerald R.; Logothetis, Anestis L.; and Verbanc, John J., to Du Pont de Nemours, E. I., and Company. Hydroxylated alpha-olefin/non-conjugated diene. 3,752,699, Cl. 117-141.000.

Harris, John A., to Rowe International, Inc. High capacity, small size vendor for cans. 3,752,357, Cl. 221-17.000.

Harris, John P. Exercising apparatus. 3,752,150, Cl. 128-2.00s.

Harrison, Charles V.; and Higginbotham, William H. Locked thermostat box. 3,752,900, Cl. 174-52.000.

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Hart, Charles H.; and Cashau, George R., to Anpa. Apparatus to facilitate insertion of newspaper supplements. 3,752,468, Cl. 270-57.000.

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Hartenstein, Johannes Hermann; and Satzinger, Gerhard, to Warner-Lambert Company. Process for the preparation of novel orally effective cardio-active cardenolides. 3,752,807, Cl. 260-239.570.

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Harvey, William B.; and Violett, Robert S. Linear-pivotal converter. 3,752,421, Cl. 244-102.0sl.

Harzer, Peter, to Goltermann, Wandel U. System for varying an oscilloscopic trace. 3,753,105, Cl. 324-121.00r.

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Hatanabe, Yoshiyuki; and Kinoshita, Koichi, to Katsuragawa Denki Kabushiki Kaisha. Apparatus for making electrographs. 3,752,572, Cl. 355-3.000.

Hathorn, Roy C. Steam removal apparatus for discharge stack. 3,751,884, Cl. 55-267.000.

Haushalter, Roger W., to United States of America, Navy. Torpedo safe separation and arming mechanism. 3,752,104, Cl. 114-20-r.

Hawker, Collin John; Curle, Wilfred Roy; and Read, Harold David, to Westland Aircraft Limited. Phase firing circuits. 3,753,044, Cl. 317-33.0sc.

Hawkins, Peter: *See—*
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Hawley, George F., to Ivanhoe Research Corporation. Processes, systems, and composite systems for manufacture of wearing apparel, headgear, footwear, components thereof and similar products. 3,752,471, Cl. 271-4.000.

Hawthorne, Peter Frederick, to Foseco International Limited. Protection of turbine casings. 3,752,683, Cl. 106-55.000.

Hay, Charles N., to General Motors Corporation. Sealed bearing with axially undulating seal lip. 3,752,544, Cl. 308-187.200.

Hayami, Heijiro: *See—*
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Hayashida, Motoyuki; Inoue, Hironobu; and Toyama, Kuniyuki, to Toyo Kogyo Co., Ltd. Exhaust gas purifying system for use in internal combustion engine. 3,751,916, Cl. 60-289.000.

Haydon, Arthur W., to Tri-Tech, Inc., mesne. Counting device. 3,752,965, Cl. 235-136.000.
Hayes, George W. Guide for hand-held electric saw. 3,751,816, Cl. 33-185.00r.
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Hedel, Kurt K., to General Electric Company. Foldback current control circuit. 3,753,078, Cl. 323-9.000.
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Hellman, Wayne R., to General Electric Company. Metal halide lamp. 3,753,019, Cl. 313-47.000.
Helmer, Josef, to Daimler-Benz Aktiengesellschaft. Securing arrangement of stator shaft at torque converter housing of a hydrodynamic torque converter. 3,751,918, Cl. 60-330.000.
Helms, Burl. Scaffold guard rail assembly. 3,752,262, Cl. 182-113.000.
Helms, Charles Robert, to Container Corporation of America. Apparatus and method for enclosing of container groups. 3,751,872, Cl. 53-32.000.
Hendry, David V. Sleeping bag. 3,751,741, Cl. 5-343.000.
Henrick, Clive A., to Zoecon Corporation. Aliphatic di-olefinic nitriles. 3,752,843, Cl. 260-465.900.
Henshilwood, Jack R., to Colab Laboratories, Inc. Biological indicator. 3,752,743, Cl. 195-127.000.
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Herter, George L., to Herter's Inc. Molding of all plastic shotshell cases. 3,752,434, Cl. 249-105.000.
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Heth, Edwin M.; and Tidland, John W. Veneer lathe charger. 3,752,201, Cl. 144-209.00a.
Hewins, Thomas Fenton, to International Business Machines Corporation. Master-slave hydraulic control system. 3,752,039, Cl. 91-171.000.
Hewins, Thomas Fenton, to International Business Machines Corporation. Master-slave hydraulic control system. 7,352,039, Cl. 91-171.000.
Heyne, Clarence A., to Owens-Illinois, Inc. Plastic carrier for containers. 3,752,305, Cl. 206-65.00e.
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Hicks, Morris R.; and Le Veque, Joseph C., to Bardons & Oliver, Inc. Programmable fluidic logic controlled machine tool. 3,752,036, Cl. 90-13.00c.
Higbee, Roland K.; and Fleck, David D., to American Hospital Supply Corporation. Caster and swivel lock assembly. 3,751,758, Cl. 16-35.000.
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Higgins, Will L. Lock for bottle-containing cases. 3,752,310, Cl. 206-65.00e.
Hilbert, Francis H., to Motorola, Inc. Variably biased audio amplifier. 3,753,121, Cl. 325-319.000.
Hill, Christopher Rowland; and McCready, Victor Ralph. Ultrasonic scanning apparatus. 3,752,255, Cl. 181-.5np.
Hill, Eugene R., to United States of America, Navy. Sample-and-mold circuit. 3,753,132, Cl. 328-151.000.
Hill Fastener Corporation: *See*—
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Hill, Howard W.; Marlowe, Mickey O.; and Kaznoff, Alexis I., to United States of America, Atomic Energy Commission. Method of preparing uniform size powders. 3,752,872, Cl. 264-.500.
Hill, Otto; Hillery, Herbert V.; and Thurston, George B., to United States of America, Navy, mesne. Electro-mechanical acoustic filter. 3,753,218, Cl. 340-8.00r.
Hill, William E., Jr., to Hill Fastener Corporation. Lock-screw fasteners. 3,752,203, Cl. 151-37.000.
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Hilsum, Cyril, to United Kingdom of Great Britain and Northern Ireland, Secretary of State for Defence in Her Britannic Majesty's Government of the. Electroluminescent devices. 3,753,231, Cl. 340-166.0el.
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Jaszczak, Ronald J., to Searle, G. D. & Co. Scintillation camera with improved resolution. 3,752,981, Cl. 250-368.000.
Jaszczak, Ronald J., to Searle, G. D. & Co. Tomographic scintillation camera with improved resolution. 3,752,982, Cl. 250-368.000.
Jautelat, Manfred; Kabbe, Hans-Joachim; and Ley, Kurt, to Bayer Aktiengesellschaft. 5-Imino-1,2,4-triazines and their production. 3,752,808, Cl. 260-249.500.
Jefferson Chemical Company, Inc.: *See—*
Milligan, John Gornod, 3,752,857.
Jenkins, Francis Edward, to Du Pont de Nemours, E. I., and Company. Process for preparing microporous open-celled cellular polymeric structures. 3,752,784, Cl. 260-2.50r.
Jenkinson, Timothy John; and Williams, Tegwyn Pierce, to Lever Brothers Company. Gel-coated frozen confection. 3,752,678, Cl. 99-136.000.
Jensen, Andrew O.: *See—*
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Ost, Walter; Thomas, Klaus; Jerchel, Dietrich; and Appel, Karl-Richard, 3,752,842.
Jernigan, William Allen; Mims, Herman D.; and Clontz, Raeford W., to Celanese Corporation. Yarn measuring and yarn feeding therefor. 3,751,981, Cl. 73-160.000.
Jerrold Electronic Corporation: *See—*
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Jinnai, Kazuhiko: *See—*
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Johannisson, Dag O. A.; and Wictorin, Ake G. R., to AGA Aktiebolag. Absorption unit for the absorption of carbon dioxide. 3,752,654, Cl. 23-284.000.
Johns-Manville Corporation: *See—*
Bailey, Gerald Dwight, 3,751,897.
Johnson, Berthuld Thomas. Scall apparatus. 3,752,245, Cl. 177-208.000.
Johnson, Cecil J.: *See—*
Leas, Lawrence E.; Leas, Robert L.; and Johnson, Cecil J., 3,751,906.
Johnson, Clair Allen, to Texas Instruments, Incorporated. Hermetically sealed electronic package. 3,753,054, Cl. 317-234.00r.
Johnson, Daniel; and Loft, Arne, to General Electric Company. Gated amplifier control with provision for supplementary control. 3,753,128, Cl. 328-71.000.
Johnson, Douglas; and Mar, Henry M., to General Motors Corporation. Duct for hot gas. 3,752,225, Cl. 165-47.000.
Johnson, Erlon Fitch; and Crabb, Donald Eugene, to AMP Incorporated. High voltage terminal strip. 3,753,216, Cl. 339-198.0ga.
Johnson, Nordahl. Quick-acting vise. 3,752,466, Cl. 269-201.000.
Johnson, S. C., & Son, Inc.: *See—*
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Johnson Service Company: *See—*
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Agarwal, Paul D.; Johnston, Richard W.; Neuman, John G.; Preiser, Mark E.; Traub, Norman L.; and Schroeder, Thaddeus, 3,753,064.
Jollivet, Christian L. Arrangement for mounting a push-button or the like on a control panel. 3,751,999, Cl. 49-89.150.
Jones, Robert Idris. Mobile grandstand. 3,752,531, Cl. 296-64.000.
Jonsson, Gregor. Shrimp processing machine and method. 3,751,766, Cl. 17-71.000.
Jorgensen, Ernest Charles. Profile copying machine. 3,751,856, Cl. 51-100.00r.
Joss, Kurt; and Ruedi, Ernst, to Burlington Industries, Inc. Durable press treatment of cellulosic textiles employing a poly-hydroxy monocarboxylic acid catalyst. 3,752,650, Cl. 8-116.200.
Jost, Karel; Pliska, Vladimir; Krejci, Ivan; and Sorm, Frantisek, to Ceskoslovenska akademie ved. Nα-acetyl-2-o-methyltyrosine-oxytocin. 3,752,799, Cl. 260-112.500.
Jost, Victor: *See—*
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Judelson, David N., to Judelson, Oscar I., Inc. Cutting mechanism for rotary knife cutting machines. 3,752,024, Cl. 82-86.000.
Judelson, Oscar I., Inc.: *See—*
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Kabushiki Kaisha Daikin Seisakusho: *See—*
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Kabushiki Kaisha Kawai Gakki Seisakusho: *See—*
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Kachi, Atsuyuki: *See—*
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Kaftan, John A. Magnetic window cleaning apparatus with improved cleaning material and locator. 3,751,750, Cl. 15-220.00a.
Kagitani, Takeo: *See—*
Matsuhita, Akira; and Fukushima, Rokuro, 3,752,750.
Kahl, William G., Jr.; and Davenport, Andrew J., to Arrowhead Enterprises, Inc. Photoelectric intrusion detector. 3,752,978, Cl. 250-340.000.
Kaiser, Webster L., Jr.: *See—*
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Kaku, Kanji; Asaba, Mitsuo; Gondo, Yasaka; Kachi, Atsuyuki; and Matsumoto, Satoshi, to Chisso Corporation. Method for producing dyeable polyolefin. 3,752,868, Cl. 260-876.00r.
Kalz, Dietmar; Wolf, Karlheinz; Wolfrum, Gerhard; and Hornle, Reinhold, to Bayer Aktiengesellschaft. Process for the conversion of perylene-3,4,9, lo-tetracarboxylic acid diimide into a form suitable as pigment dyestuff. 3,752,686, Cl. 106-288.00q.
Kaminsky, Daniel, to Warner-Lambert Company. Method for producing antihypertensive activity. 3,752,891, Cl. 424-249.000.
Kaminstein, Bernard, to Olivetti, Ing., C., & C., S.p.A. Method for duplicating a preliminary copy. 3,752,076, Cl. 101-450.000.
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Kane, Wills; and Cardwell, Paul H., to Deepsea Ventures, Inc. Recovery of metal values from ocean floor nodules. 3,752,745, Cl. 204-105.00m.
Kaneda, Isao; and Takeuchi, Kiyokazu, to New Nippon Electric Company Ltd. Discharge-lamp operating device using thyristor oscillating circuit. 3,753,037, Cl. 315-99.000.
Kanegafuchi Boseki Kabushiki Kaisha: *See—*
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Kapperman, Francis C.: *See—*
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Karagozian, Jack; and Rudnicki, William E., to Ford Motor Company. High pressure liquid pump. 3,752,601, Cl. 417-300.000.
Karg Machine Products, Inc.: *See—*
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Karl, Georg. Student's and artists paint brushes. 3,751,751, Cl. 15-192.000.

Karlen, Urs: *See—*
Diamantoglou, Michael; Adelliker, Hans Peter; Staub, Alfred; Bosshard, Hans; and Karlen, Urs, 3,752,831.

Karpal, David L., to Teledyne, Inc. Nonspill Battery vent plug. 3,752,173, Cl. 137-43.000.

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Kastner, Gerhard; and Lohman, Klaus, to Fernseh G.m.b.H. Pulse width discriminator. 3,753,135, Cl. 329-106.000.

Kataoka, Shoei; and Yamada, Hideo, to Kogyo Gyustuin; a/k/a Industrial Science and Technology Ministry of International Trade and Industry, Agency of. Displacement transducer. 3,753,202, Cl. 338-32.00h.

Katayama, Hitoshi: *See—*
Yamaguchi, Isao; and Katayama, Hitoshi, 3,752,571.

Kato, Saburo; and Hokari, Saburo, to Kabushiki Kaisha Ricoh. Audiovisual apparatus. 3,752,574, Cl. 353-19.000.

Kato, Tetsuo, to Nippondenso Co., Ltd. Relay for voltage regulator. 3,753,178, Cl. 335-135.000.

Katsura, Takeshi, to Ono Sokki Co., Ltd. Torsion digital viscometer. 3,751,975, Cl. 73-59.000.

Katsuragawa Denki Kabushiki Kaisha: *See—*
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Kay, Charles. Panel assembly and machine. 3,751,794, Cl. 29-526.000.

Kayden, Edward. Display devices. 3,752,323, Cl. 211-132.000.

Kaznoff, Alexis I.: *See—*
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Kearns, William J.; and Jensen, Andrew O. Gas laser structure. 3,753,144, Cl. 331-94.500.

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Keller, Charles Herman; and Wilson, Patrick Oliver, to Pek, Inc., mesne. Light exposure apparatus and method. 3,752,579, Cl. 355-97.000.

Keller, Otto: *See—*
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Kelley, James O.: *See—*
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Kendig, Willard Z., to Pollution Controls Industries, Inc. Fuel metering device for internal combustion engine. 3,752,451, Cl. 261-39.00b.

Kennametal Inc.: *See—*
Oaks, Seibert S.; and Claar, Ethamore F., 3,752,515.

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Kern, Seymour P., to Applied Life Design Corporation. Eye examination device. 3,752,152, Cl. 128-21.000.

Kernan, George L. Flare dispersing and igniting apparatus. 3,752,082, Cl. 102-37.800.

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Kerwood, Joseph Edward: *See—*
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Khan, Ausat Ali, to Du Pont de Nemours, E. I., and Company. Isolation of a fluoropolymer from a latex. 3,752,789, Cl. 260-47.0ua.

Khrustsevich, Leonid Alexandrovich: *See—*
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Kiehl, Jean-Pierre; and Jost, Victor, to Societe Generale des Produits Refractoires. Insulating refractory and a method for manufacturing same. 3,752,684, Cl. 106-58.000.

Kiehs, Karl; and Fischer, Adolf, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. S-(N-Isobutynyl-N-phenylcarbamoylmethyl) dithiophosphates. 3,752,869, Cl. 260-943.000.

Kiffmeyer, William W.; and Radtke, Joseph D., to Allen-Bradley Company. Method and means for updating the position dimension of a numerically controlled machine tool. 3,752,969, Cl. 235-151.110.

Kiffmeyer, William W.; and Sackman, David J., to Allen-Bradley Company. Printer adapted for operation with a programmable controller. 3,753,246, Cl. 340-172.500.

Kilpatrick, Robert G.: *See—*
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Kimberley, John A., to AMBAC Industries, Inc. Apparatus for controlling rate of fuel injection. 3,752,137, Cl. 123-139.00r.

Kimura, Kunio: *See—*
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Kind, Dieter; Hartel, Hagln; Salge, Jurgen; and Brilka, Rudolf (said Hartel, said Salge and said Brilka, assor to said), 3,753,042.

Kind, Dieter; Hartel, Hagln; Salge, Jurgen; and Brilka, Rudolf, said Hartel, said Salge and said Brilka, assor to said Kind, Dieter. Apparatus for the current limiting interruption of currents at high voltages. 3,753,042, Cl. 317-11.00a.

Kindl, Helmut; and Westermeier, Heinz, to Siemens Aktiengesellschaft. Gas laser. 3,753,149, Cl. 331-94.50g.

King, Jerry N.: *See—*
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King, John L., Jr. Transducer mounting assembly. 3,753,219, Cl. 340-5.00r.

King, Robert, to Imperial Metal Industries (Kynoch) Limited. Method of manufacturing a refractory lined continuous casting die. 3,751,788, Cl. 29-423.000.

King, William Roy. Fluid flow proportioning device. 3,752,176, Cl. 137-118.000.

King-Seeley Thermos Co.: *See—*
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Kingsbury, Charles M.; and Colby, Harold S., to Emhart Corporation. Apparatus for installing insulation on a staple. 3,751,902, Cl. 59-71.000.

Kinoshita, Koichi: *See—*
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Kinoshita, Tsukuru: *See—*
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Kioritz Corporation: *See—*
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Kistner, Hermann F., to Maschinenbau Oppenweiler Binder & Co. Folding machine and method of pressing a fold. 3,752,469, Cl. 270-61.000.

Kitamura, Yoshinori, to Matsushita Electric Industrial Co., Ltd. High-voltage stabilizer. 3,753,033, Cl. 315-29.000.

Kiwi Coders Corporation: *See*—
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Kizilos, Apostolos P., to Honeywell Inc. Control apparatus. 3,752,401, Cl. 239-265.350.

Klein, Gerald, to Siemens Aktiengesellschaft. Bearing system for shafts driven by an electric motor. 3,753,016, Cl. 310-90.000.

Klein, Sheldon. Protective lock casing. 3,751,948, Cl. 70-55.000.

Kleinberg, Israel; Golub, Lorne M.; Borden, Samuel M.; and Settler, Morris, to Harco Electronics Ltd. Device and method for the quantitative measurement of fluid on paper strips. 3,753,099, Cl. 324-61.0qs.

Klemt, Arthur, to Arthur Kommanditgesellschaft Klemt. Torsioned light conducting means for the illumination of an image field with modulated light. 3,752,561, Cl. 350-96.00r.

Klepping, Roland P., to Display Corporation International. Stanchion for beverage tap. 3,752,192, Cl. 137-802.000.

Klien, Gert: *See*—
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Klien, Oswald; Klien, Gert; and Marie, Paul, to Head Sportgerate Ges. m.b.H. Apparatus for the production of guide channels of skis. 3,752,021, Cl. 83-5.000.

Kline, William M., to Medical Evaluation Devices & Instruments Corporation. Centrifuge tube for untra-violet analysis. 3,752,146, Cl. 128-2.00a.

Klockner-Werke AG: *See*—
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Wouters, Martin Willem Jan Maria; and Warnke, Hans, 3,752,053.

Klotz, Erhard Paul Arthur, to U.S. Philips Corporation. Apparatus for making multiple point holograms. 3,752,555, Cl. 350-3.500.

KMS Industries, Inc.: *See*—
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Knapp, George P., to Mount Hope Machinery Company. Method and apparatus for controlling latera spacings of elongated elements. 3,752,377, Cl. 226-3.000.

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Knedel, Maximilian; Krech, Hans; Ockert, Dietrich; Schipper, Phillip; Haas, Werner; and Lsensee, Klaus-Steffen, to Siemens Aktiengesellschaft. Sample divider for a liquid being examined. 3,751,985, Cl. 73-423.00a.

Kniepkamp, Glenn E. Apparatus for welding with granular flux or a rotatable cylindrical surface. 3,752,951, Cl. 219-73.000.

Knight, Basil Edward; deceased (by Knight, Norman Henderson; and Hodge, Harold Redmore; executors); and Fenne, Ivor, to C.A.V. Limited. Liquid fuel injection pumping apparatus. 3,752,136, Cl. 123-139.0at.

Knight, Bruce L.: *See*—
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Knight, Charles L., to Portage Newspaper Supply Company. Adhesive applying machine. 3,752,114, Cl. 118-5.000.

Knight, Norman Henderson: *See*—
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Knowles, Martin; and Tulloch, Harold Lucas, to Lucas, Joseph, (Industries) Limited. Bearing for pumps. 3,752,608, Cl. 418-131.000.

Kobayashi, Juichi: *See*—
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Kobayashi, Nasaaki. Method and apparatus for positioning patterns of a photographic mask on the surface of a wafer on the basis of backside patterns of the wafer. 3,752,589, Cl. 356-172.000.

Kobayashi, Osamu: *See*—
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Kobayashi, Sadao: *See*—
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Kobayashi, Torao; Inaga, Hisashi; and Nakagawa, Kumaichi, to Kioritz Corporation. Two-cycle internal combustion engines. 3,752,129, Cl. 123-73.00a.

Kobe Steel, Ltd.: *See*—
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Kobetz, Paul: *See*—
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Kobinger, Walter: *See*—
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Kobusch, Klaus; and Manke, Arno, to APEG-Hochdrucktechnik. Sorting devices. 3,752,311, Cl. 209-72.000.

Koeber, Henry J.: *See*—
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Koff, Richard M. Three-dimensional string sculpture. 3,752,730, Cl. 161-7.000.

Kogyo Gyustuin; a/k/a Industrial Science and Technology Ministry of International Trade and Industry, Agency of: *See*—
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Kohler, Gottfried, to MTV Munchen GmbH. Turbojet aero engines having means for engine component cooling and compressor control. 3,751,909, Cl. 60-39.170.

Kolaian, Jack H.: *See*—
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Kolbly, Richard B., to California Institute of Technology. Pocket size microwave radiation hazard detector. 3,753,116, Cl. 325-363.000.

Kolkman, Dirk, to U.S. Philips Corporation. Discharge lamp arrangement. 3,753,027, Cl. 313-318.000.

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Komatsu, Susumu: *See*—
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Konrad, Charles E.: *See*—
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Kooi, Else, to U.S. Philips Corporation. Method of manufacturing an IGFET and the product thereof. 3,752,711, Cl. 148-33.300.

Koontz, James L.; Lewelling, James D.; Fink, Drake C.; and Sutton, Robert S., to Ex-Cell-O Corporation. Electronic structure for and method of random tool selection. 3,753,237, Cl. 340-172.500.

Koppe, Herbert: *See*—
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Koppelmann, Eldo K., to Amtel, Inc. Adjustable burnishing tool. 3,751,781, Cl. 29-90.00r.

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Kornbichler, Heinz; and Seidle, Peter, to Licentia Patent-Verwaltungs-GmbH. Control rod arrangement particularly for boiling water reactors. 3,752,736, Cl. 176-36.00r.

Korponay, Jozsef. Fuel injecting carburetor. 3,752,454, Cl. 261-41.00b.

Kovtun, Alexandr Karpovich: *See*—
Denbnovetsky, Stanislav Vladimirovich; Kovtun, Alexandr Karpovich; and Sigorsky, Vitaly Petrovich, 3,753,111.

Krafft, Frederick G. Deburring apparatus. 3,752,755, Cl. 204-225.000.

Kramer, Pieter, to U.S. Philips Corporation. Current source for supplying a current having an exponential wave form. 3,753,131, Cl. 328-145.000.

Kratochvil, Egon: *See*—
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Kraus, Charles F., to Excelermatic, Inc. Hydrostatic thrust bearing. 3,752,542, Cl. 308-9.000.

Kraus, Thaddaus, to Balzers Patent und Beteiligungs Aktiengesellschaft. Resistance heater graphite test capsule. 3,751,965, Cl. 73-19.000.

Krause, Erich, to Universal Maschinenfabrik Dr. Rudolf Schieber KG. Flat knitting machine with multiple carriages. 3,751,944, Cl. 66-64.000.

Krautkremer, Franz, to Schottel-Werft, Josef Becker KG. Movable carrier for a watercraft. 3,752,343, Cl. 214-505.000.

Krech, Hans: *See*—
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Kronies, Reinhard Kurt; and Coupland, John Robert, to Burroughs Corporation. Fast inhibit gate with applications. 3,753,014, Cl. 307-217.000.

Kruger, James B.; and Cooper, Joseph, to Scovill Manufacturing Company. Yarn design forming tool. 3,751,776, Cl. 28-2.000.
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Kurtz, Robert L. Real time moving scene holographic camera system. 3,752,556, Cl. 350-3.500.
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Lafebre, Adolph. Protective vehicle trim strip. 3,752,521, Cl. 293-1.000.
Lagace, Prejean. Aircraft using lifting fans. 3,752,417, Cl. 244-12.00c.
L'Air Liquide, Societe Anonyme pour l'Exploitation: *See*—
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Langheinrich, Wolfgang Friedrich, to International Telephone and Telegraph Corporation. Advanced mechanism for inked ribbons or the like. 3,752,290, Cl. 197-162.000.
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Lawrence, William John, Jr. Two-piece suction pump. 3,752,366, Cl. 222-207.000.
Layne, Melvin E., to Lee, Raymond, Organization, Inc., The. Panel to form composite concrete-reinforced wall. 3,751,867, Cl. 52-426.000.
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Leas, Lawrence E.; Leas, Robert L.; and Johnson, Cecil J., to Leas Brothers Development Corporation. Pollution controller. 3,751,906, Cl. 60-39.020.
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Leger, Andre; and Mauron, Gerard, to Automobiles Peugeot and Regie Nationale des Usines Renault. Device simultaneously controlling the locking and release of a plurality of doors. 3,751,950, Cl. 70-264.000 7 11/08/71.
Lehmann, Karl-Heinz: *See*—
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Lewis, Robert E.; and Tenorio, Joseph I., to General Electric Company. Stable solutions containing molybdenum-99 and process of preparing same. 3,752,769, Cl. 252-301.10r.
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Liebert, Martin; Delle, Heinz; and Kabisch, Gerhard, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of hydrogen peroxide. 3,752,885, Cl. 423-588.000.
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Lunn, Alick Thompson, to Vickers Limited. Microscopes incorporating incident-light dark ground illumination systems. 3,752,560, Cl. 350-91.000.
Lustig, Claude D.; and Baird, Albert W., III, to Sperry Rand Corporation. Digitally addressable gas discharge display apparatus. 3,753,041, Cl. 315-169.0tv.
Lyder, Alfred W. Wheel chair locking arrangement. 3,752,265, Cl. 188-2.00f.
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MacDonald, Kenneth A. Folding cabinet of molded construction. 3,752,552, Cl. 312-258.000.

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Madonia, Anthony F. Dough conditioning apparatus. 3,752,448, Cl. 259-186.000.

Madrid, Robert W.: *See*—
Hagenbach, Robert J.; and Madrid, Robert W., 3,752,666.

Magnavox Company, The: *See*—
Close, Ernest Frederick, 3,753,119.

Maguire, Mary H.; Thorp, Roland H.; and Nobbs, Denis M., to University of Sydney, The. 2-Loweralkylthioadenosines. 3,752,805, Cl. 260-211.50r.

Mahan, William A. Metal detector search coil. 3,753,185, Cl. 336-84.000.

Maheux, Peter Francis; and Van Dyk, Robert Maarten, to Bell Canada-Northern Electric Research Limited. Connector for the electrical connection of flexible conductors. 3,753,207, Cl. 338-17.00f.

Mahoney, Elmo J., to Mahoney, Inc. Projectile return apparatus. 3,752,476, Cl. 273-1.50a.

Mahoney, Inc.: *See*—
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Makabe, Hideki, to Shimadzu Seisakusho Ltd. Fluid switching device. 3,752,167, Cl. 137-609.000.

Maki, Kenji: *See*—
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Malchenko, Viktor Matveevich: *See*—
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Mallory, P. R., & Co., Inc.: *See*—
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Malmin, Oscar. Disposable headband and filter. 3,752,157, Cl. 128-146.700.

Manifacier, Andre: *See*—
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Marine Salvage Company: *See*—
Muller, Rudolf; and Zenner, Herbert, 3,751,926.

Marioneaux, Harry. Fluid injection lance and nozzle means therefor. 3,752,402, Cl. 239-132.300.

Marker, Hannes: *See*—
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Markey, Allen H.: *See*—
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Marlowe, Mickey O.: *See*—
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Marr, John A.; and Maskrey, Robert H., to Moog Inc. Electrical feedback servovalve. 3,752,189, Cl. 137-625.650.

Marsh, John: *See*—
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Martin, Norman L.: *See*—
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Martin, Rex, to Lucas, Joseph, (Industries) Limited. Lamp failure warning system for road vehicles. 3,753,224, Cl. 340-80.000.

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Yamamoto, Hisao; Inaba, Shigeho; Hirohashi, Toshiyuki; Yamamoto, Michihiro; Ishizumi, Kikuo; Akatsu, Mitsuhiro; Maruyama, Isamu; Kume, Yoshiharu; Mori, Kazuo; and Izumi, Takahiro, 3,752,806.

Maruyama, Sadanobu; and Wakayama, Tsuneo, to Kongo Yakuhin Kabushiki Kaisha. Process for anti-oxidation against lipid. 3,752,832, Cl. 260-398.500.

Maryland Plastics Incorporated: *See*—
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Mascioletti, Ascanio. Structures for the assembly of fixtures for doors, windows and the like. 3,751,868, Cl. 52-731.000.

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Mathews, Thomas E. PD rule. 3,752,566, Cl. 351-5.000.

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Matsuhita, Akira; and Fukushima, Rokuro, to Matsushita, Akira and Kagitani, Takeo. Method for electrodeposition. 3,752,750, Cl. 204-181.000.

Matsui, Masao; and Yamabe, Masahiro, to Kanegafuchi Boseki Kabushiki Kaisha. Mix-spinning apparatus. 3,752,616, Cl. 425-131.000.

Matsumoto, Satoshi: *See*—
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Mattfeld, Johann; and Pieper, Frank, to Licentia, Patent-Verwaltungs-G.m.b.H. Amplifier. 3,753,137, Cl. 330-15.000.

Matthews, Jamie F., Jr., to Esso Production Research Company. Recovery and repair of offshore pipelines. 3,751,932, Cl. 61-72.100.

Matusmoto, Akio: *See*—
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Maurer, William C.; Miller, James F.; and Hickman, Ira D., to Esso Production Research Company. Swivel. 3,752,507, Cl. 285-12.000.

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Maute, Robert E.: *See*—
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Mazuela, Jose Luis Pemjean. Game employing tiltable game board and movable ball and rings. 3,752,480, Cl. 273-109.000.

Mazza, Lamberto, to Industrie A. Zanussi S.p.A. Method and apparatus for transferring commands from the control site to the recording site in closed loop television installations. 3,752,907, Cl. 178-5.600.

Mazza, Lamberto, to Industrie A. Zanuser S.p.A. Safety device against radiation leakage from microwave apparatus. 3,753,003, Cl. 307-117.000.

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McAfee, Darrell F., to DeLaval Turbine, Inc. Differential pressure switch with pivoted one-piece rigid flat switch-actuating disc member captured between two rolling diaphragms. 3,752,942, Cl. 200-83.00y.

McBride, William E., to Lowrance Electronics Mfg. Corporation. Apparatus for mounting a transducer to the transom of a boat. 3,752,431, Cl. 248-291.000.

McCabe-Powers Body Company: *See*—
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McDermott, Philip Auguste; and Semsel, Andrew Milo, to American Cyanamid Company. Containers for chemical light solutions. 3,752,406, Cl. 240-2.250.

McDonald, Grover C., to Lee, Raymond, Organization, Inc., The. Fire alarm system. 3,753,256, Cl. 340-227.100.

McDonald, Johnnie F.; and Sparber, Frederick J. Wire support structure. 3,751,869, Cl. 52-650.000.

McDowell, Glenn S.: *See*—
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McKay, Roderick, to Weber Marking Systems, Inc. Handprinter construction. 3,752,071, Cl. 101-125.000.

McKee Baking Company: *See*—
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McKeown, James E.; and Phinney, Earl M., to Bendix Corporation, The. Blasting machine. 3,752,081, Cl. 102-70.20r.

McKinley, Jack M.: *See*—
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McKinley, Roe L.; and McKinley, Jack M. Gas-steam generating apparatus. 3,751,905, Cl. 60-39.050.

McLaren, James C., to Tenneco, Inc. Pleat deformation control for pleated fluid treatment media. 3,752,321, Cl. 210-493.000.

McManus, James M., to Pfizer Inc. N-alkyl tetrahydrocarbazoles. 3,752,823, Cl. 260-315.000.

McManus, William K., to Sperry Rand Corporation. Gain compensated traveling wave tube. 3,753,030, Cl. 315-36.000.

McMillan Electronics Corporation: *See*—
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McMillan, Robert D., Jr., to McMillan Electronics Corporation. Ozone generating apparatus and method. 3,752,748, Cl. 204-157.10r.

McNeely, Charles D. Air scrubber. 3,751,885, Cl. 55-267.000.

McNeil Laboratories, Inc.: *See*—
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McShane, Herbert Felix, Jr.; and Verbanc, John Joseph, to Du Pont de Nemours, E. I., and Company. Chlorinated toluenediamine curing agents for use in preparing polyurethane elastomers and foams. 3,752,790, Cl. 260-77.5am.

McVey, Malcolm John. Linear bearings. 3,752,541, Cl. 308-6.00c.

McWhorter, Hillman M. Retractable and detachable wheel assembly. 3,752,493, Cl. 280-43.210.

MDT Instrument Company: *See*—
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Meinecke, Clarence A., Jr. Axle assembly for vehicles. 3,752,496, Cl. 280-81.00r.

Meissinger, Hans F., to TRW Inc. Method of and device for determining the characteristics and flux distribution of micrometeorites. 3,752,996, Cl. 250-219.0df.

Meitinger, Heinz; and Lietze, Joachim, to Bifora-Uhren J. Bidlingmaier GmbH. Timepiece calendar information changing apparatus. 3,751,901, Cl. 58-58.000.

Meller, Oscar W.: *See*—
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Menzin, Marvin; Blanz, John H.; Harvey, Andrew C.; and Rhee, San Soon, to American Velcro, Inc., mesne. Production of a continuous molded plastic strip. 3,752,619, Cl. 425-134.000.

Mercer, James B. Treatment of chronic fatigue following acute disease. 3,752,889, Cl. 424-273.000.

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Shen, Tsung-Ying; Greenwald, Richard; Witzel, Bruce E.; and Walford, Gordon L., 3,752,813.

Merck, Yves; and Vion, Jean-Marie, to UCB Societe Anonyme. Fireproof polyesters from halogenated salicylic acid. 3,752,867, Cl. 260-869.000.

Mergenthaler, Helmut, to Keller, Otto. Apparatus for scrubbing of gaseous fluids. 3,751,883, Cl. 55-248.000.

Merjan, Stanley. Piling. 3,751,931, Cl. 61-53.000.

Merritt Division of Murphy Pacific Marine Salvage Company: *See*—
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Merten, Rudolf: *See*—
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Merwin, Roy L., to Dynamic Information Systems, Inc. Data entry and retrieval composite display system. 3,753,240, Cl. 340-172.500.

Metritape, Inc.: *See*—
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Metzer, Robert George, to Du Pont de Nemours, E. I., and Company. Water swollen cellulose and blends dyed with insoluble, non-vattable anthraquinone dyes in a glycol ether solution. 3,752,647, Cl. 8-21.00c.

Meyer, Franz-Josef, to Goetzewerke Friedrich Goetze. Measuring apparatus. 3,751,812, Cl. 33-178.00r.

Meyer, Max E. Flag pole light. 3,752,975, Cl. 240-2.000.

Meynier, Maurice J., Jr., to Crawfish Boat Company, Inc. Pivoting motor boat drive unit. 3,752,111, Cl. 115-35.000.

Middleton, William A., to United States of America, Navy. Control system for submersibles to minimize bottom sediment disturbances. 3,752,103, Cl. 114-16.00r.

Miki, Isao, to Nippon Light Metal Company Limited. Oxygen flush die casting method and apparatus. 3,752,213, Cl. 164-113.000.

Miller, Ellsworth S.: *See*—
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Miller, Everett R., to Owens-Corning Fiberglas Corporation. Method of making inlaid resins and article produced thereby. 3,752,690, Cl. 117-8.000.

Miller, George J., to SCM Corporation. Developing unit. 3,753,174, Cl. 355-10.000.

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Miller, Marshall W.: *See*—
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Miller, Wendell S. Electrostatic copying machine. 3,752,573, Cl. 355-11.000.

Milligan, John Gornod, to Jefferson Chemical Company, Inc. Nonionic surfactant with low pour point. 3,752,857, Cl. 260-615.00b.

Milligan, Lee J., to Peripheral Systems Corporation. Motor speed regulation system. 3,753,067, Cl. 318-314.000.

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Mitchell, Ray M. Display device. 3,751,839, Cl. 40-158.00r.
Mitsubishi Denki Kabushiki Kaisha: *See*—
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Mochel, Ellen L., to Corning Glass Works. Strengthened glass article. 3,752,729, Cl. 161-1.000.
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Molis, Benedict, to Lift Parts Mfg., Inc. Stock picker assembly with self-contained drive means. 3,752,345, Cl. 214-515.000.
Mollere, John C., to Western Geophysical Company of America. Method for generating seismic impulses below the earth's surface. 3,752,256, Cl. 181-.5xc.
Molzaon, Herbert W.; Tashiro, Donald R.; and Ralph, Harold D., to International Harvester Company. Implement transport structure. 3,751,891, Cl. 56-228.000.
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Moore, Earl P., Jr., to Du Pont de Nemours, E. I., and Company. Refractory laminate based on negative sols or silicates and polymeric lattices containing cationic surfactants. 3,752,679, Cl. 106-38.350.
Moore, Earl P., Jr., to Du Pont de Nemours, E. I., and Company. Refractory laminate based on positive sols and polymer lattices containing anionic surfactants. 3,752,680, Cl. 106-38.350.
Moore, Earl P., Jr., to Du Pont de Nemours, E. I., and Company. Refractory laminate based on positive sols and monofunctional organic acids and salts. 3,752,681, Cl. 106-38.350.
Moore, Earl P., Jr., to Du Pont de Nemours, E. I., and Company. Refractory laminate based on positive sols and organic or inorganic bases. 3,752,689, Cl. 106-38.300.
Moore, Lawrence A., to Beloit Corporation. Furnace for blow moulding method and apparatus. 3,752,641, Cl. 432-57.000.
Moore, Stuart I., to United States of America, Navy. Cable connector. 3,753,215, Cl. 339-136.00m.
Moore, William Percy, Jr., to Allied Chemical Corporation. Process for the production of hydrogen-halides from a brine. 3,752,883, Cl. 423-481.000.
Morchand, Charles A.; and Dudley, Don J., to Data-Plex Systems, Inc. High resolution television transmission. 3,752,911, Cl. 178-6.800.
Moreau, Jean Pierre A.; and Schuler, Georges, to Sescosem-Societe Europeenne de Semiconducteurs et de Microelectronique. Crystal-controlled oscillators. 3,753,154, Cl. 331-116.00r.
Moreland, Stephen T. Apparatus for continuous sausage manufacture. 3,752,618, Cl. 425-133.000.
Morgan, David A., to Honeywell Inc. Chromagography valve. 3,751,992, Cl. 73-422.0gc.
Morgan, Thomas E., Jr.: *See*—
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Morgan, Thomas E., Sr.; and Morgan, Thomas E., Jr., to Friedman, Leonard. Apparatus for bonding brake linings. 3,752,062, Cl. 100-93.0pb.
Morgan, Veldon. Bridle control bit. 3,751,877, Cl. 54-6.000.
Morgenthaler, Frederic R., to Chu Associates, Inc. Electromagnetic wave-elastic wave transducer and method. 3,753,163, Cl. 333-30.00r.
Morgenthaler, Frederic R., to Chu Associates, Inc. Tunable variable bandwidth magneto-elastic filter and method. 3,753,165, Cl. 333-17.000.
Mori, Kazuo: *See*—
Yamamoto, Hisao; Inaba, Shigeho; Hirohashi, Toshiyuki; Yamamoto, Michihiro; Ishizumi, Kikuo; Akatsu, Mitsuhiro; Maruyama, Isamu; Kume, Yoshiharu; Mori, Kazuo; and Izumi, Takahiro, 3,752,806.
Mori, Keijiro; Sugahara, Akito; Yamamoto, Kozo; and Takeda, Yukio, to Matsushita Electric Industries Co., Ltd. Magnetic-recording and reproducing apparatus which is automatically placed in forward mode after response to a previous control signal. 3,752,937 Cl. 179-100.20s.
Mori, Teijiro: *See*—
Ito, Toshio; Miyamoto, Toshio; Wada, Yuichi; and Mori, Teijiro, 3,753,190.
Morita, Houyo; and Okino, Kazuyoshi. Combination of archery bow and vibration dampener. 3,752,142, Cl. 124-24.000.
Moriyama, Yashiro; and Okamoto, Takafumi, to Nitto Electric Industrial Co., Ltd. Process for the production of pressure-sensitive adhesives. 3,752,716, Cl. 156-3.000.
Morrien, Albertus Marinus: *See*—
Van Elk, Cornelis Johannes; Raaigever, Frederik; Van Der Lee, Jan Gijsbert Dirk; and Morrien, Albertus Marinus, 3,753,141.
Morris, Alvan M.: *See*—
Noll, Carroll G.; and Morris, Alvan M., 3,751,807.
Morris, Eugene B., Jr.: *See*—
Hull, Gerry G.; and Morris, Eugene B., Jr., 3,751,871.
Morris, Philip, Incorporated: *See*—
Begemann, Carl J., 3,752,308.
Morris, William A.; and Clark, Samuel S. High pressure butterfly valve. 3,752,181, Cl. 137-375.000.
Morrison, Elbert F.; and Joy, Raymond D., to Burlington Industries, Inc. Apron drafter for textile system. 3,751,768, Cl. 19-244.000.
Morrissey, William J., to General Instrument Corporation. Glass for coating semiconductors, and semiconductors coated therewith. 3,752,701, Cl. 117-201.000.
Morse, Charles Ernest, to Bell Telephone Laboratories, Incorporated. Key telephone call distributing system. 3,752,936, Cl. 179-99.000.
Morton, Arthur Francis; Belanger, Francois; and Anhang, William, to Northern Electric Company, Limited. Wire piercing method and apparatus. 3,751,960, Cl. 72-326.000.
Morton, Arthur W.; and Lloyd, Donald, to Tex-Tube Division of Detroit Steel Corporation. Non-destructive testing apparatus for detecting both transverse and longitudinal weld defects with a single inspection. 3,753,085, Cl. 324-37.000.
Moschetta, Joseph. Modified synchroscope. 3,752,583, Cl. 356-23.000.
Moseley, L. Max, to Teledyne Industries, Inc. Digital flow calculator. 3,752,393, Cl. 235-151.340.
Moser, Howard P. Refrigerator shelf guards. 3,752,324, Cl. 211-153.000.
Mosley, Gerald: *See*—
Foley, Gerard M.; and Mosley, Gerald, 3,752,917.
Motoren- und Turbinen-Union Munchen GmbH: *See*—
De Tartaglia, Peter, 3,751,911.
Motorola, Inc.: *See*—
Clapper, Steven L., 3,753,009.
Frederiksen, Thomas M.; Davis, William F.; and Russell, Ronald W., 3,753,012.
Hilbert, Francis H., 3,753,121.
Mott, George E.; and Wilbourn, James F., to Texaco Inc. Articulated marine structure with prepositioned anchoring piles. 3,751,930, Cl. 61-46.500.
Mott, John L. Trouser-suspender connecting trolley means for toilet convenience. 3,751,732, Cl. 2-230.000.
Motz, Joseph W.; Dick, Charles E.; Placious, Robert C.; and Sparrow, Julian H., to United States of America, Commerce. Method of producing an intense, high-purity K X-ray beam. 3,752,989, Cl. 250-401.000.
Mount Hope Machine Company, Incorporated: *See*—
Hannaway, John H., 3,751,774.
Mount Hope Machinery Company: *See*—
Knapp, George P., 3,752,377.

MTS Systems Corporation: *See*—
Gross, Alan E., 3,751,994.
MTV Munchen GmbH: *See*—
Kohler, Gottfried, 3,751,909.
Mueller, Helmut C., to Bigelow-Sanford, Inc. Looper and method for producing cut pile tufts. 3,752,096, Cl. 112-79.00r.
Mueller, Otto. Transmission with brake operated down shifter. 3,752,275, Cl. 192-4.00a.
Muller, Rudolf; and Zenner, Herbert, to Gebr Knaub Wesldeulsche Gipswerke, Marine Salvage Company and Saarbergwerke Aktiengesellschaft. Method of erecting wall structures in mine workings. 3,751,926, Cl. 61-36.00r.
Muller, Russell V.: *See*—
Remke, Theodore Karl; and Muller, Russell V., 3,752,529.
Muller, Wolfgang, to Goldschmidt, Th., A.G. Flux for galvanizing, tin plating and lead coating. 3,752,882, Cl. 423-463.000.
Mulling, John W. Refrigerant sight glass. 3,752,185, Cl. 137-559.000.
Multi-Amp Corporation: *See*—
Ettelman, David J., 3,753,088.
Multi-Systems, Inc.: *See*—
Stanley, James M., 3,752,467.
Multitec A.G.: *See*—
Hansen, Fritz Ernst, 3,751,823.
Mumma, Paul R. Knot tying jig. 3,752,516, Cl. 289-17.000.
Munder, Paul Gerhard; and Fischer, Herbert, to Boehringer Ingelheim G.m.b.H. Lysolecithins as immunologic adjuvants. 3,752,886, Cl. 424-199.000.
Munshower, Kenneth; and Smoyer, James R., to Elco Corporation. Contact crimping tool employing individual insulation and wire crimp adjustments plus lightweight housing having side arms and opposed plates. 3,751,963, Cl. 72-410.000.
Munson Mill Machinery Co.: *See*—
Nowak, Leon J., 3,752,445.
Murakami, Noboru, to Aisin Seiki Kabushiki Kaisha. Hydraulic control system for automatic speed changing devices. 3,752,015, Cl. 74-869.000.
Murbach, Erwin, to Zellweger Ltd. Method and apparatus for cleaning calibrated nozzles. 3,752,170, Cl. 134-37.000.
Murphy, William J.: *See*—
National Aeronautics and Space Administration, 3,751,913.
Murray, William K.: *See*—
Bernat, Henry A.; and Murray, William K., 3,752,230.
Musick, Charles R.; and Remshaw, Richard P., to Combustion Engineering, Inc. Instrumentation for nuclear reactor core power measurements. 3,752,735, Cl. 176-19.000.
Musso, Pietro: *See*—
Di Padova, Sergio; and Musso, Pietro, 3,752,379.
Mustee, Bernard L., to Mustee, E. L., & Sons, Inc. Free-standing shower stalls. 3,751,737, Cl. 4-146.000.
Mustee, E. L., & Sons, Inc.: *See*—
Mustee, Bernard L., 3,751,737.
Muzyczko, Thaddeus M.; and York, David L., to Richardson Company, The. Polyalkylenimine-urea-aldehyde cationic resins. 3,752,781, Cl. 260-29.40r.
Myers Electric Products, Inc.: *See*—
Plummer, Merle A., 3,753,049.
Myers, James G.; Berg, Francis J.; and Martus, Bernard R., to Philco-Ford Corporation. Apparatus for boresighting a laser beam emitter device. 3,752,587, Cl. 356-153.000.
Myers, Lewis William: *See*—
Baker, Myron Lewis; and Myers, Lewis William, 3,752,974.
Nada, Naohiro: *See*—
Nakamura, Shoichi; Nada, Naohiro; and Okubo, Tsuneo, 3,752,934.
Nagai, Yoshitoshi, to Tomy Kogyo Co., Ltd. Toy vehicle. 3,751,851, Cl. 46-206.000.
Nagashima, Motoi, to Shima Kogaku Kabushiki Kaisha. Zoom lens apparatus. 3,752,565, Cl. 350-255.000.
Nagata, Kanjiro. High impact resistant double-walled container. 3,752,351, Cl. 220-9.00r.
Nagy, Georges F.; Balde, Daniel; and Deloy, Pierre, to Ugine Kuhlmann. Process for the production of brominated aromatic compounds. 3,752,856, Cl. 260-612.00r.
Naidich, Herbert H.; and Boncer, John J., to United Aircraft Corporation. CRT with build-in display registration test. 3,753,032, Cl. 315-18.000.
Nakada, Masancri: *See*—
Kurahashi, Koichiro; Nakada, Masancri; Sato, Harunori; Nishimura, Koichi; and Abe, Masaaki, 3,752,918.
Nakagawa, Kumaichi: *See*—
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Nakamoto, Hideo: *See*—
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Nakamura, Hitoshi: *See*—
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Nakamura, Kiichi: *See*—
Miura, Taro; Nakamura, Kiichi; and Hashimoto, Tadashi, 3,753,156.
Nakamura, Kinya, to Matsushita Electric Industrial Co., Ltd. Cassette-type magnetic tape recording and reproducing apparatus. 3,752,486, Cl. 274-4.00c.
Nakamura, Shoichi; Nada, Naohiro; and Okubo, Tsuneo. Stereo demodulating circuit triggered by a minimum input signal level. 3,752,934, Cl. 179-15.0bt.
Nakaoka, Tomio: *See*—
Miyoshi, Akira H. L.; Nakaoka, Tomio; Takahashi, Hasaaki; and Okuda, Kensuke, 3,753,188.
Nameishi, Naoyuki; Yoshino, Hajime; and Uto, Shigetoshi, to Harima Refractories Co., Ltd. Zircon-pyrophyllite unfired refractory bricks and method for the manufacture of the same. 3,752,682, Cl. 106-57.000.
Nardin, Roy; and Sposato, Frank J., to Logimetrics, Inc. Signal generators employing digital phase locked loops and compensating circuits. 3,753,142, Cl. 331-1.00a.
Nasypany, Paul, to Remington Arms Company, Inc. Forestock latching mechanism for firearms. 3,751,841, Cl. 42-75.00a.
National Aeronautics and
Space Administration; Administrator; with respect to an invention of:
Lewis, Beverley W.; Stokes, Charles S.; Smith, Edward W.; and Murphy, William J. Barium release system. 3,751,913, Cl. 60-215.000.
Rosin, Seymour; and Amon, Max. Ritchey-chretien telescope. 3,752,559, Cl. 350-55.000.
Space Administration with respect to an invention of; Administrator:
Husain-Abidi, Akram S. Optical data processing paraboloidal mirror segments. 3,752,564, Cl. 350-162.0sf.
National Cash Register Company, The: *See*—
Gilberg, Robert C.; Donohue, James P.; and Patel, Ramesh S., 3,752,958.
Patel, Ramesh S., 3,753,227.
National Distillers and Chemical Corporation: *See*—
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National Engineering Company: *See*—
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National Research Development Corporation: *See*—
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Nauman, Edward F.: *See*—
Vassiliades, Anthony E.; Nauman, Edward F.; and Shroff, Shrenik, 3,752,698.
Naymark, Sherman, to Nuclear Services Corporation. Nuclear reactor plant and multiple purpose shielding system therefor. 3,752,738, Cl. 176-87.000.
Neale, Michael John; and Gotch, Henry Edward, to Roulard, Rene Andre Louis. Apparatus for treating human hair. 3,752,399, Cl. 239-101.000.
Nedelec, Lucien: *See*—
Bucourt, Robert; and Nedelec, Lucien, 3,752,855.
Needler, Daniel George; and Graham, James Leo, to Eastman Kodak Company. Photographic film element and method for obtaining photographic records of water-submerged objects. 3,752,670, Cl. 96-74.000.
Neilly, Geoffrey C., Jr.: *See*—
Fuller, George A., Jr.; Langevin, Wilfred Louis; Neilly, Geoffrey C., Jr.; and Pearson, Ole B., 3,752,097.
Nelkin, Arthur; and Geil, Frederick G., to Westinghouse Electric Corporation. Pulse reflection test means for balanced pressure surveillance detector. 3,753,260, Cl. 340-242.000.
Nelson, Edward J.; and Brown, Ilo M., to Ballantyne of Omaha, Inc. Projector mechanism. 3,752,569, Cl. 352-139.000.
Nelson, Hersey B.: *See*—
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Nemecek, Petr: *See*—
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Neuhaus, Hans Wilhelm: *See*—
Bertram, Uwe; Hoffmann, Hans; and Neuhaus, Hans Wilhelm, 3,753,005.
Neuhierl, Herman. Components for toy vehicle tracks. 3,751,847, Cl. 46-1.00k.
Neuman, John G.: *See*—
Agarwal, Paul D.; Johnston, Richard W.; Neuman, John G.; Preiser, Mark E.; Traub, Norman L.; and Schroeder, Thaddeus, 3,753,064.
New Nippon Electric Company Ltd.: *See*—
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New York Wire Mills Corporation: *See*—
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Newash, Mahmood S., to Dow Corning Corporation. Artificial cutaneous stoma. 3,752,162, Cl. 128-348.000.
Newell, Isaac Laird; and Houlihan, William F., to Heatbath Corporation. Corrosion resistant composition and method. 3,752,707, Cl. 148-6.200.
Newell, Isaac Laird; and Houlihan, William F., to Heatbath Corporation. Corrosion resistant composition and method. 3,752,708, Cl. 148-6.200.
Newman, George. Protective lock ring assembly. 3,751,953, Cl. 70-381.000.
Newman, James J. Rechargeable lighting system for bicycles and the like. 3,753,000, Cl. 307-9.000.
Newman, Robert H.: *See*—
Fritzinger, Dale A.; and Newman, Robert H., 3,752,909.
Newman, Robert H.; and Pluck, Mervyn M., to General Electric Company. Pilot voltage supply & voltage regulation means. 3,752,903, Cl. 178-7.50r.

Newton, Alwin B., to Borg-Warner Corporation. Rotary gas compressor. 3,752,605, Cl. 418-8.000.

Newton, Alwin B., to Borg-Warner Corporation. Start-up system for inverter driven motor including inverter bypass circuitry. 3,753,069, Cl. 318-440.000.

Nichols, Nathan P. Battery tester having a pliable resilient body member for accomodating the battery to be tested. 3,753,095, Cl. 324-29.500.

Nichols, Newlin S.: *See—*
Armstrong, Phillip E.; Kaiser, Webster L., Jr.; Nichols, Newlin S.; Schmidt, John E.; and Stephenson, Orlando W., III, 3,752,756.

Nicita, Domenico: *See—*
Parmeggiani, Paolo; Nicita, Domenico; and D'Alo, Bruno, 3,752,457.

Niejadlin, John, to Metritape, Inc. Short circuit proof level sensor. 3,753,200, Cl. 338-42.000.

Niemeyer, Lois. Hamper cart. 3,752,550, Cl. 312-237.000.

Niemiec, Albin J.; and Pettibone, Raymond B., to Sperry Rand Corporation. Vane pump with fluid-biased end walls. 3,752,609, Cl. 418-133.000.

Nii, Riro: *See—*
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Nikolas, Andrew H.; and Shaffer, Harold R., to Westinghouse Air Brake Company. Synchronizing arrangement for digital data transmission systems. 3,753,228, Cl. 340-146.10d.

Nilsson, Jan, to Allmanna Svenska Elektriska Aktiebolaget. Press for hydrostatic extrusion of tubes. 3,751,957, Cl. 72-60.000.

Nilsson, Jan; and Larker, Hans, to Allmanna Svenska Elektriska Aktiebolaget. Press for hydrostatic extrusion of tubes. 3,751,958, Cl. 72-60.000.

Nilsson, Vilgot Raymond, to Alfa-Laval AB. Centrifugal separator with control means. 3,752,389, Cl. 233-20.00r.

Nippon Electric Company, Limited: *See—*
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Iwakami, Takuya, 3,753,161.
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Nippon Hoso Kyokai: *See—*
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Nippon Kogaku K.K.: *See—*
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Nippon Kokan Kabushiki Kaisha: *See—*
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Nippon Light Metal Company Limited: *See—*
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Nippon Telegraph and Telephone Public Corporation: *See—*
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Nishikawa, Hideo: *See—*
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Nishikawa, Yasuo: *See—*
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Nishimura, Koichi: *See—*
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Nisigaki, Minoru: *See—*
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Nissan Motor Company, Limited: *See—*
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Nobbs, Denis M.: *See—*
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Noel, Eugene M.: *See—*
Hubbell, Roger K.; and Noel, Eugene M., 3,752,295.

Noel, Eugene N. Semi-automatic loader for continuous muffin griddles. 3,752,341, Cl. 214-314.000.

Noll, Carroll G.; and Morris, Alvan M. Dental instrument. 3,751,807, Cl. 32-52.000.

Norbeck, Dean K., to Borg-Warner Corporatic n. Refrigeration system PRV motor control system. 3,751,940, Cl. 62-217.000.

Nordell, Randy J.; and Kimball, Harold C. Mechanical latch. 3,752,519, Cl. 292-111.000.

Nordgren, Alfred A., to New York Wire Mills Corporation. Apparatus for cage rolling and welding. 3,752,949, Cl. 219-56.000.

Nordskog, Robert A. Self venting valve. 3,752,177, Cl. 137-216.000.

Norgren, C. A., Co.: *See—*
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Norman, David; and Soane, Keith, to Ronson Corporation. Unitary fingerpiece and ignition actuator. 3,752,637, Cl. 431-274.000.

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Notbohm, Willard C., to Black Clawson Company, The. Multi-ply paper machine. 3,752,734, Cl. 162-123.000.

Nowak, Leon J., to Munson Mill Machinery Co. Screw lifter mixer. 3,752,445, Cl. 259-3.000.

Nuclear Services Corporation: *See—*
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Nueller, Max B.; Salatiello, Peter P.; and Sawhney, Dulari L., to Allied Chemical Corporation. Novel polytetrafluoroethylene prepared in the presence of a fluoroalkanoic acid salt dispersing agent and octafluorocyclobutane. 3,752,796, Cl. 260-92.100.

N.V. Nederlandse Kraanbouw Mij: *See—*
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Oakley, John E.: *See—*
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Oakley, John Richard; and Kearns, Shaun. Carton flap sealing. 3,751,876, Cl. 53-375.000.

Oaks, Seibert S.; and Claar, Ethamore F., to Kennametal Inc. Resilient keeper ring. 3,752,515, Cl. 287-52.00r.

Obayashi, Nobuharu, to Kabushiki Kaisha Kawai Gakki Seisakusho. Electronic musical instrument. 3,752,898, Cl. 84-1.010.

Oberai, Avtar S.: *See—*
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Obermann, George: *See—*
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Ochiai, Takeshi, to Toyota Jidosha Kogoyo Kabushiki Kaisha. Pressure modulator assembly. 3,752,537, Cl. 303-21.00f.

Ockert, Dietrich: *See—*
Knedel, Maximilian; Krech, Hans; Ockert, Dietrich; Schipper, Phillip; Haas, Werner; and Lsensee, Klaus-Steffen, 3,751,985.

Odenweller, Joseph D., to Ethyl Corporation. Phenol nitration process. 3,752,858, Cl. 260-622.00r.

Oehler, Carl W., to Oehler Steel Company, mesne. Pull trailer and load lift means. 3,752,502, Cl. 280-440.000.

Oehler Steel Company, mesne: *See—*
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O'Hern, Harold A., Jr.; and Olson, Kermit E., to Owens-Illinois, Inc. Process for increasing reaction rate in conversion of sulfides and hydrosulfides. 3,752,875, Cl. 423-201.000.

Ohman, Leo S. Variable resistances for an electrical circuit. 3,753,201, Cl. 338-92.000.

Ohno, Kiyomitsu. Article dispensing device with sequentially releasable hinged shelves. 3,752,358, Cl. 221-90.000.

Ohsawa, Hiroji; Enosawa, Kazuo; Hayami, Heijiro; and Sasabe, Kaoru, to Nippon Hoso Kyokai and Matsushita Electric Industrial Co., Ltd. System for converting facsimile signals. 3,752,912, Cl. 178-6.000.

Ohsawa, Mitsuo, to Sony Corporation. Control signal generating circuit. 3,753,120, Cl. 325-455.000.

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Ojha, Narayanlal D.: *See—*
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Okabe, Katsuhiko, to Victor Company of Japan, Ltd. Automatic and continuous cassette player. 3,752,485, Cl. 274-4.00f.

Okada, Kazuo; Wade, Takeo; and Furuoya, Itsuo, to Takeda Chemical Industries, Ltd. Method for the production of isoprene. 3,752,863, Cl. 260-681.000.

Okamoto, Takafumi: *See—*
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Okanao, Takeshi: *See—*
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Okubo, Tsuneo: *See—*
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Okuda, Kensuke: *See—*
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Okuto, Hiroshi; and Yasuda, Kiyoshi, to Takeda Chemical Industries, Ltd. Antimony aminoalkoxide. 3,752,837, Cl. 260-446.000.

Olbermann, John H., Jr. Transmission oil cooling system. 3,752,222, Cl. 165-35.000.

Olcott, Bernard: *See—*
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Oldenburg, Kenneth F., to Litton Business Systems, Inc. Business machines. 3,752,392, Cl. 235-7.00r.

Oldenburg, Kenneth F., to Litton Business Systems, Inc. Business machines. 3,752,957, Cl. 235-7.00r.

Olechowskil, Jerome Robert: *See—*
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Olivetti, Ing., C., & C., S.p.A.: *See—*
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Di Padova, Sergio; and Musso, Pietro, 3,752,379.
Kaminstein, Bernard, 3,752,076.
Viadana, Sergio, 3,752,622.

Olliges, William E.; Polanek, Edward L.; and Gurney, Robert, to Universal Research Laboratories, Incorporated. Tape cassette changer system. 3,752,483, Cl. 274-4.00f.

Olmo, Harold P.; and Studer, Henry E., to University of California, The Regents of the. Raisin grape spreader. 3,751,821, Cl. 34-93.000.

Olson, John E., to Hyster Company. Multiple State crane boom. 3,752,327, Cl. 212-55.000.

Olson, Kermit E.: *See—*
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Olson, Roger A.; Osero, Norman H.; and Mentone, Pat F., to Buckbee-Mears Company. Power supply for pulse electroplating. 3,752,754, Cl. 204-228.000.

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Olympus Optical Co., Ltd.: *See—*
Sato, Masanobu, 3,752,046.

O'Nan, Thomas C.; Walters, Charles W.; and Booe, James M., to Mallory, P. R., & Co., Inc. Method of making a capacitor having a self-depolarizing electrolyte. 3,751,797, Cl. 29-570.000.

O'Neal, Wilbert O., to Vendo Company, The. Selective dispensing apparatus having door interlock structure. 3,752,546, Cl. 312-35.000.

O'Neill, Feiten Michael. Envelope window punch. 3,752,026, Cl. 83-589.000.

Ono, Shigeo; and Hamaguchi, Ichiro, to Nippon Kogaku K.K. Electronic timer control for a shutter. 3,752,045, Cl. 95-10.0ct.

Ono Sokki Co., Ltd.: *See—*
Katsura, Takeshi, 3,751,975.

Ooe, Yosio: *See—*
Ikeda, Hironosuke; and Ooe, Yosio, 3,753,110.

Ooka, Toship, to Sumitomo Electric Industries, Ltd. Floating type disc brake. 3,752,272, Cl. 188-345.000.

Opal, Kenneth E.; and Kelly, Charles R., to Power Control Corporation. Apparatus for center-referenced pulse width modulation. 3,753,155, Cl. 332-9.00r.

Ores, Bernard: *See—*
Courtois, Monique; and Ores, Bernard, 3,752,741.

Orlando, Charles M.; Cataneo, Ferdinand; and Engel, Lawrence J., to Esso Research and Engineering Company. Gem-difluoroamino unsaturated hydrocarbons. 3,752,853, Cl. 260-583.0nh.

Orlett, Michael J., to Lilly, Eli, and Company. Dinitrophenylazides as herbicides and their preparation. 3,752,661, Cl. 71-125.000.

Ory, Gaston C. Forging machine. 3,751,959, Cl. 72-237.000.

Osder, Stephen S., to Sperry Rand Corporation. Augmented washout circuit for use in automatic pilots. 3,752,420, Cl. 244-77.00d.

Osero, Norman H.: *See—*
Olson, Roger A.; Osero, Norman H.; and Mentone, Pat F., 3,752,754.

Osmundsen, Norman K.; Harder, John E.; and Nitta, Tohei, to Westinghouse Electric Corporation. Shielded metal enclosed lightning arrester. 3,753,045, Cl. 317-62.000.

Ost, Walter; Thomas, Klaus; Jerchel, Dietrich; and Appel, Karl-Richard, to Boehringer, C. H., Sohn. N-(β-cyano-ethyl)-N,N-bis-(1-amido-2,2,2-trichloro) ethyl) alkylenediamines. 3,752,842, Cl. 260-465.400.

Ota, Kunihiko: *See—*
Ishikawa, Nasashi; and Ota, Kunihiko, 3,753,125.

Otsuka Kagaku Yakuhin Kabushiki Kaisha: *See—*
Otsuka, Masatomi; Hirose, Yoshio; Kinoshita, Tsukuru; and Misawa, Takesi, 3,752,849.

Otsuka, Masatomi; Hirose, Yoshio; Kinoshita, Tsukuru; and Misawa, Takesi, to Otsuka Kagaku Yakuhin Kabushiki Kaisha. Manufacture of levulinic acid. 3,752,849, Cl. 260-531.00r.

Ott, Arnold C. Axle-mounted wheel exercising device with spring resistance located centrally within the wheel. 3,752,475, Cl. 272-83.00a.

Ottinger, August F.: *See—*
Graham, Paul R.; Merchant, Morris V.; and Ottinger, August F., 3,752,733.

Otto, Guenther H.: *See—*
Roy, Upendra; Otto, Guenther H.; and Reece, Orvil Y., 3,752,665.

Oudijk, Tommy A.: *See—*
White, James E.; Correll, Quentin E.; Swain, Allan L.; Talbot, Leo Robert; Collado, Ernest E.; and Oudijk, Tommy A., 3,752,074.

Overesch, Albert, to Maschinenfabrik Krone, Bernard, GmbH. Mowing machine. 3,751,889, Cl. 56-13.600.

Owen, William L., Jr.; and Woods, William L., Jr., to Western Electric Company, Incorporated. Multi-directional indexing apparatus. 3,751,997, Cl. 74-89.000.

Owens, William A., to Electric Systems, Inc. Control circuit for AC motor. 3,753,061, Cl. 318-212.000.

Owens-Corning Fiberglas Corporation: *See—*
Miller, Everett R., 3,752,690.

Owens-Illinois, Inc.: *See—*
Harmon, Shepard Lewis, 3,752,294.
Heyne, Clarence A., 3,752,305.
Liddle, David E., 3,753,038.
O'Hern, Harold A., Jr.; and Olson, Kermit E., 3,752,875.

Oxenrider, Bryce C.; Woolf, Cyril; Dear, Robert E. A.; and Beyleveld, Wilhelmus M., to Allied Chemical Corporation. Process for preparing fluoroperhaloalkyl nitriles. 3,752,840, Cl. 260-465.700.

Oxford Industries, Inc.: *See—*
Hunter, John P., Jr.; and Huddleston, Erie George, 3,752,099.

Ozawa, Yasuo, to Sony Corporation. Magnetic recording and reproducing apparatus having electrical switching interlocked with mechanical controls to sense the presence or absence of a cartridge tab. 3,752,938, Cl. 179-100.20z.

Paar, Alois; and Konig, Fritz, to Losenhausen Maschinenbau AG, mesne. Method and apparatus for compacting the placement material in road building. 3,752,592, Cl. 404-102.000.

Pace, Edwin L., to General Electric Company. Bucket vibration damping device. 3,752,599, Cl. 416-190.000.

Pace Incorporated: *See—*
Lloyd, Richard E.; Young, Loring E.; and Siegel, William J. (said Lloyd and said Young assors. to), 3,752,017.

Packard, Norman M., to International Harvester Company. Manufacturing process for piston engines having compression king reading. 3,751,784, Cl. 29-156.40r.

Pajevic, Paul. Measuring device. 3,751,811, Cl. 33-141.00r.

Pal, Ajoy Kumar, to Portec, Inc. Train detector. 3,752,426, Cl. 246-249.000.

Pallesi, Sam W., 20% to Lee, Raymond, Organization Inc., The. Cat litter box. 3,752,120, Cl. 119-1.000.

Panousis, Peter Theodore: *See—*
Lynes, Dennis Joseph; and Panousis, Peter Theodore, 3,753,248.

Pantaze, Peter C.: *See—*
Branham, Norvil R.; and Pantaze, Peter C., 3,752,207.

Paramount Textile Machinery Co.: *See—*
Allison, Rudolph L.; and Goellner, Willy J., 3,752,023.

Parke Davis & Company: *See—*
Graetz, Ernest F. J., 3,753,124.

Parker, Alan Keith; and Warner, Dwight Allen, to Daedalus Enterprises, Inc. Method and apparatus for making a temperature-referenced color strip map of thermal variations. 3,752,915, Cl. 170-6.70r.

Parker, Earl R.: *See—*
Zackay, Victor F.; and Parker, Earl R., 3,752,709.

Parmeggiani, Paolo; Nicita, Domenico; and D'Alo, Bruno, to Snia Viscosa Societa' Nazionale Industra Applicazioni Viscosa. Method and equipment for continuously spinning and stretching synthetic filaments. 3,752,457, Cl. 214-210.00f.

Parsons, Ralph, Company, The: *See—*
Beavon, David K., 3,752,877.

Pascoe, Peter Francis: *See—*
Wollner, Johannes; Pascoe, Peter Francis; and Arendsen, Hans, 3,752,821.

Paskow, Larry J.: *See—*
Gordon, Larry; and Paskow, Larry J., 3,752,047.

Patel, Ramesh S.: *See—*
Gilberg, Robert C.; Donohue, James P.; and Patel, Ramesh S., 3,752,958.

Patel, Ramesh S., to National Cash Register Company, The. Parity check logic for a code reading system. 3,753,227, Cl. 340-146.1aj.

Patrick, John. Tape cutter. 3,751,806, Cl. 30-294.000.

Pauza, William Vito; and Smith, John Franklin, III, to AMP Incorporated. Connecting means for ceramic substrate package. 3,753,211, Cl. 339-75.0mp.

Pawloski, James A.; and Williams, Grahame I. Multi-piston power pack unit for fluid actuated tool. 3,752,040, Cl. 91-411.00a.

Payne, Betty Lou B.: *See—*
Weiden, Mathias H. J.; and Payne, Linwood K., Jr., 3,752,838.

Payne, Linwood K., Jr.: *See—*
Weiden, Mathias H. J.; and Payne, Linwood K., Jr., 3,752,838.

Pearl, David Raymond: *See—*
Gerber, Heinz Joseph; and Pearl, David Raymond, 3,752,027.

Pearson, Ole B.: *See—*
Fuller, George A., Jr.; Langevin, Wilfred Louis; Neilly, Geoffrey C., Jr.; and Pearson, Ole B., 3,752,097.

Pearson, Russell O.: *See—*
Busuttil, Henry L.; Kreisler, Sol S.; McGibbeny, James R.; and Pearson, Russell O., 3,753,206.

Pedain, Josef: *See—*
Arlt, Dieter; Bertram, Hans-Herwig; Pedain, Josef; Zankl, Erich; Zankl, Walter; and De Ramis, Angelika Zankl, 3,752,793.

Pedersen, Paul K.; Wagstaff, Robert A.; and Waldrop, Thomas W., to Sperry Rand Corporation. Forage harvester knife sharpener with a rotary abrasive wheel. 3,751,859, Cl. 51-249.000.

Pek, Inc., mesne: *See—*
Keller, Charles Herman; and Wilson, Patrick Oliver, 3,752,579.

Pelech, Ivan: *See—*
Gillette, Dean; and Pelech, Ivan, 3,753,175.

Pennekamp, Jan Christiaan: *See—*
Meijer, Hiksterus Auguste Johannes Maria; and Pennekamp, Jan Christiaan, 3,751,779.

Pennwalt Corporation: *See—*
Sheppard, Chester Stephen; and MacLeay, Ronald Edward, 3,752,802.

Pensabene, Saverio F., to General Electric Company. High capacity rechargeable sealed cell. 3,752,705, Cl. 136-13.000.
Peripheral Systems Corporation: *See—*
Milligan, Lee J., 3,753,067.
Perot, Joseph Charles, to Brown & Root, Inc. Apparatus for entrenching submerged elongate structures. 3,751,927, Cl. 61-72.400.
Perreau, Pierre, to Schlumberger Instruments et Systemes. Color motion-picture projection system. 3,752,568, Cl. 352-66.000.
Pertot, Alfred G. Centrifugal casting machine having molten metal level detector. 3,752,214, Cl. 164-156.000.
Peters, Anthony, mesne: *See—*
Jurgens, Francis T., 3,753,072.
Petersen, Gerald A. Spread-legged staple retainer for excavating tooth. 3,751,834, Cl. 37-142.00r.
Petersen, Kenneth C.; and Blowers, Charles A., to Schenectady Chemicals Incorporated. Halogenated methylol phenols. 3,752,780, Cl. 260-25.000.
Peterson, Charles K.: *See—*
Frankel, Donald P.; and Peterson, Charles K., 3,752,090.
Peterson, Donald E., to Amana Refrigeration, Inc. Magnetron starting circuit. 3,752,948, Cl. 219-10.550.
Peterson, Donald W.; and Wyczalek, Floyd A., to General Motors Corporation. Vehicle fuel tank venting system. 3,752,135, Cl. 123-136.000.
Peterson, Lenart A.; and Finley, John G., to Phillips Petroleum Company. Reusable, tear-resistant polyolefin-paper laminate. 3,752,732, Cl. 161-165.000.
Peterson, Otis G.: *See—*
Reynolds, George A.; Tuccio, Sam A.; Peterson, Otis G.; and Specht, Donald P., 3,753,146.
Peterson, Virgil V., 1/2 each to Mitchell, Dean W. and Smith, James B. Hydraulically operated elevator feeder. 3,752,296, Cl. 198-94.000.
Petro-Tex Chemical Corporation: *See—*
Arganbright, Robert P., 3,752,864.
Pettibone, Raymond B.: *See—*
Niemiec, Albin J.; and Pettibone, Raymond B., 3,752,609.
Pettinga, Robert: *See—*
Cozzy, Thomas William; and Pettinga, Robert, 3,752,035.
Pettipiece, Kenneth J., to United States of America, Atomic Energy Commission. Electrical wave pumped pulsed laser. 3,753,152, Cl. 331-94.500.
Pezzuiti, David August, to Bell Telephone Laboratories, Incorporated. Digital frequency comparator. 3,753,130, Cl. 328-141.000.
Pfeiffer, Hans Walter: *See—*
Bernold, Jean P., 3,751,929.
Pfister, Karl; Sletzinger, Meyer; and Hinkley, David F., to Merck & Co., Inc. Esters of indenyl alkanoic acids. 3,752,844, Cl. 260-470.000.
Pfizer Inc.: *See—*
Abushanab, Elie, 3,752,812.
McManus, James M., 3,752,823.
Pfrengle, Kenneth R.: *See—*
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Philco-Ford Corporation: *See—*
Franck, Howard S., 3,752,350.
Myers, James G.; Berg, Francis J.; and Martus, Bernard R., 3,752,587.
Philippe, Jean B., to Ferlux. 5-phenyl-isox azole-3-carboxylic acids and their derivatives. 3,752,819, Cl. 260-295.00r.
Philipps, Louis E.; and Stanis, Eugene A., to Medelco, Incorporated. Record reading system. 3,753,245, Cl. 340-172.500.
Philips Electronics and Pharmaceutical Industries Corporation: *See—*
Zingaro, William P., 3,753,020.
Phillips, David H.; and Phillips, Ruth E., to United States of America, Navy. Remote time transfer system with epoch pulse. 3,751,900, Cl. 58-24.00r.
Phillips, Norman D., to Fuller Company. Gas scrubber with moisture eliminator. 3,751,882, Cl. 55-236.000.
Phillips Petroleum Company: *See—*
Crouch, Willie W.; and Williams, Ralph P., 3,752,659.
Deutsch, Peter R., 3,752,436.
Peterson, Lenart A.; and Finley, John G., 3,752,732.
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Phillips, Ruth E.: *See—*
Phillips, David H.; and Phillips, Ruth E., 3,751,900.
Phinney, Earl M.: *See—*
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Pick, Hans H., to Kennecott Copper Corporation. Method and apparatus for matrix-effect-compensated continuous X-ray analysis of streams of solid particles. 3,752,979, Cl. 250-375.000.
Picker Corporation: *See—*
Slague, Edward, 3,752,991.
Picker, Manfred: *See—*
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Pieper, Frank: *See—*
Mattfeld, Johann; and Pieper, Frank, 3,753,137.
Pike, Victor Eugene, to General Electric Company. Ultrasonic inspection system with pseudo-isometric display. 3,751,976, Cl. 197-67.900.
Pilafidis, Emile J., to Cincinnati Milacron Inc. Method and apparatus for producing signals representing the most significant eccentricities of a plurality of simultaneously rotating spindles. 3,752,968, Cl. 235-151.110.
Pinat, Gaston. Knife grinder. 3,751,855, Cl. 51-5.000.
Pinior, Gernot: *See—*
Sick, Erwin; Pinior, Gernot; and Plockl, Johann, 3,752,999.
Pinkham, Jesse Randolph; Clark, Douglas Copeland; and Wilkinson, Donald Ross, to Reynolds, R. J., Tobacco Company. Device for handling bagged or bundled soft material. 3,752,337, Cl. 214-147.00g.
Pitney-Bowes, Inc.: *See—*
Tramposch, Herbert; and Kabak, Daniel M., 3,752,068.
Pitts, Thomas E.: *See—*
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Placious, Robert C.: *See—*
Motz, Joseph W.; Dick, Charles E.; Placious, Robert C.; and Sparrow, Julian H., 3,752,989.
Plasser, Franz; Theurer, Josef; and Schweinhammer, Manfred, to Plasser, Franz, Bahnbaumaschinen Industriegesellschaft m.b.H. Mobil track survey apparatus for determining the tract camber. 3,751,815, Cl. 33-146.000.
Plasser, Franz, Bahnbaumaschinen Industriegesellschaft m.b.H.: *See—*
Plasser, Franz; Theurer, Josef; and Schweinhammer, Manfred, 3,751,815.
Theurer, Josef, 3,752,332.
Pliska, Vladimir: *See—*
Jost, Karel; Pliska, Vladimir; Krejci, Ivan; and Sorm, Frantisek, 3,752,799.
Plockl, Johann: *See—*
Sick, Erwin; Pinior, Gernot; and Plockl, Johann, 3,752,999.
Plouffl, Leo A., to Texas Instruments, Incorporated. Condition responsive control apparatus. 3,753,043, Cl. 317-13.00a.
Pluck, Mervyn M.: *See—*
Newman, Robert H.; and Pluck, Mervyn M., 3,752,903.
Plummer, Merle A., to Myers Electric Products, Inc. Multiple connectable power outlet box with conduit separating baffles. 3,753,049, Cl. 317-107.000.
Plumpe, Hans; and Puls, Walter, to Bayer Aktiengesellschaft. Sulphonyl-ureas and sulphonyl-semicarbazides containing heterocyclic acyl amino groups and their production. 3,752,818, Cl. 260-287.00r.
Polanek, Edward L.: *See—*
Olliges, William E.; Polanek, Edward L.; and Gurney, Robert, 3,752,483.
Polaroid Corporation: *See—*
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Young, Richard W., 3,752,692.
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Politechnika Wroclawska: *See—*
Rutkowski, Marian; and Wieckowska, Jadwiga, 3,752,656.
Pollock, Lyle W., to Phillips Petroleum Company. Process and apparatus for improving the removal of harmful components from engine exhaust gases. 3,751,914, Cl. 60-284.000.
Pollution Controls Industries, Inc.: *See—*
Kendig, Willard Z., 3,752,451.
Polyvend, Inc.: *See—*
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Porta Systems Corporation: *See—*
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Portec, Inc.: *See—*
Pal, Ajoy Kumar, 3,752,426.
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Porter, Alvin J., to Product Design & Engineering, Inc. Method of mounting a sealing disc in a cap for a container. 3,751,787, Cl. 29-421.00r.
Porter, Marion Gene: *See—*
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Porter, Richard E.: *See—*
Crawford, Arthur R.; Barnett, Glenroy W.; Porter, Richard E.; and Pottebaum, Joseph R., 3,753,082.
Porter, Townsend H.: *See—*
Thompson, John F.; and Porter, Townsend H., 3,752,768.
Potin, Marcel, to Societe Financiere Francais de Licences et Brevets. Process for the manufacture of a slide fastener. 3,752,718, Cl. 156-66.000.
Pottebaum, Joseph R.: *See—*
Crawford, Arthur R.; Barnett, Glenroy W.; Porter, Richard E.; and Pottebaum, Joseph R., 3,753,082.
Power Control Corporation: *See—*
Opal, Kenneth E.; and Kelly, Charles R., 3,753,155.
PPG Industries, Inc.: *See—*
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Praeger, Eberhardt P.; and Wolfset, Brian A., to Honeywell Inc. Method and apparatus for terminating electrical ribbon cable. 3,751,801, Cl. 29-628.000.
Precision Screen Machines, Inc.: *See—*
Jaffa, David, 3,752,070.
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Zacpal, Zdenek; and Nemecek, Petr, 3,752,455.
Prescoti, Thomas Gates, to Varian Associates. Means for retaining gas-filled vial in pre-Tr unit. 3,753,158, Cl. 333-13.000.

Price, Everett R.: *See—*
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Price, Franklin H., Jr.: *See—*
Sims, Dewey M., Jr.; and Price, Franklin H., Jr., 3,752,513.
Price, James D. Apparatus for use in making patterns for elbows for cylindrical products, and other layouts. 3,751,808, Cl. 33-75.00r.
Price, Ralph E.; and Bickford, Cudley V., to Landis Tool Company, mesne. Loader mechanism for a machine tool. 3,751,857, Cl. 51-215.00h.
Price, Robert: *See—*
Worley, James C.; and Price, Robert, 3,753,166.
Pridy, Whetstine B. Oil well tubing cleaner. 3,752,229, Cl. 166-72.000.
Pritchett, William Arthur, Jr., to Du Pont de Nemours, E.I., and Company. Silver halide emulsion fogged with a boron hydride and a gold compound. 3,752,674, Cl. 96-108.000.
Pro, George M. Necktie knot-forming tool. 3,752,374, Cl. 223-111.000.
Pro-Tech, Inc.: *See—*
Blechman, Robert M., 3,751,990.
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Procter & Gamble Company, The: *See—*
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Prontor-Werk Alfred Gauthier GmbH: *See—*
Rentschler, Waldemar T., 3,752,049.
Propst, Robert L.; and Kelley, James O., to Miller, Herman, Inc. Stackable drawer and cover. 3,752,547, Cl. 312-107.000.
Proulx, Romeo T., to Wright, Barry, Corporation. Filing system. 3,751,837, Cl. 40-78.130.
Psaras, John Dimocritos, to Allied Chemical Corporation. Apparatus and process for commingling multifilament yarn. 3,751,775, Cl. 28-1.400.
Pulling, Richard C.: *See—*
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Purnival, Thomas J.: *See—*
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Quanbeck, Sherman H.; and Gleason, Harold T. Haystack making machine. 3,751,892, Cl. 56-344.000.
Quellette, Paul Rene; deceased (by Quellette, Yvonne; legatee). Cable tire chain tensioning and locking device. 3,752,204, Cl. 152-219.000.
Quellette, Yvonne: *See—*
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Quenelle, Robert, to IMS Corporation. Fluorescent lamp strobing circuit. 3,753,040, Cl. 315-241.00s.
Quester Corporation: *See—*
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Quinlan, William J.; and Hover, Lawrence L., to Hastings Manufacturing Company. Windshield wiper assembly. 3,751,754, Cl. 15-250.420.
Qurashi, Maqbool; and Faries, Lincoln W., to Jerrold Electronic Corporation. Weather time display. 3,752,919, Cl. 178-7.880.
Raaigever, Frederik: *See—*
Van Elk, Cornelis Johannes; Raaigever, Frederik; Van Der Lee, Jan Gijsbert Dirk; and Morrien, Albertus Marinus, 3,753,141.
Raasch, Maynard Stanley, to Du Pont de Nemours, E. I., and Company. Diels-alder adducts of bis-(trifluoromethyl) thioketene. 3,752,827, Cl. 260-327.0th.
Raboeuf, Andre: *See—*
Bermann, Francis; Courtaud, Paul; Dioux, Claude; Manifacier, Andre; Raboeuf, Andre; and Ruffet, Pierre, 3,752,985.
Racy, Stanley, to Line Fast Corporation. Container coupler. 3,752,511, Cl. 287-2.000.
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Raichle, Karl: *See—*
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Rajchan, Jan Aleksander, to RCA Corporation. Array of devices responsive to differential. 3,753,247, Cl. 340-173.01s.
Ralph, Harold D.: *See—*
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Ralston, James Michael: *See—*
Dixon, Richard Wayne; Ralston, James Michael; and Rosenzweig, Walter, 3,752,980.
Ramovist, Lars Henry, to Rederiaktiebolaget Nordstjernan. Sintered hard metal product. 3,752,655, Cl. 29-182.500.
Ramunda, Angelo J.; deceased (by Ramunda, Phyllis G.; executrix); Adams, Phillip; Beinfest, Sidney; and Gulakowski, Thaddeus A., to Millmaster Onyx Corporation. Treatment of cellulosic fiber containing fabrics to improve the physical characteristics. 3,752697, Cl. 117-138.80f.
Ramunda, Phyllis G.: *See—*
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Rana, Sudhir N., to Flexogenics Inc. Collapsible container. 3,752,349, Cl. 220-6.000.
Ranet, Ernst L.; and Pfrengle, Kenneth R., to General Motors Corporation. Air induction valve for exhaust emission control system. 3,751,915, Cl. 60-290.000.
Rapistan Incorporated: *See—*
Sullivan, Norman M.; and Fitzgerald, Francis J., Jr., 3,752,339.
Rapparlie, Hans; and Burkhardt, Konstanz Gisbert, to Licentia Patent-Verwaltungs-G.m.b.H. Stack forming apparatus. 3,752,043, Cl. 93-93.0dp.
Rauch, Stewart E., Jr.; and Mayer, Edward H., to Bethlehem Steel Corporation. Steel pickling method. 3,752,169, Cl. 134-3.000.
Raue, Roderich; and Kuhlthau, Hans-Peter, to Bayer Aktiengesellschaft. Carbazole dyestuffs. 3,752,822, Cl. 260-315.000.
Raue, Roderich; and Kuhlthaus, Hans-Peter, to Bayer Aktiengesellschaft. Phenyl-heteryl-methane dyestuffs. 3,752,825, Cl. 260-326.110.
Rawlins, Wendell G. Signal interpreting circuit. 3,753,073, Cl. 321-6.000.
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Read, Harold David: *See—*
Hawker, Collin John; Curle, Wilfred Roy; and Read, Harold David, 3,753,044.
Ream, Jon C. Carpet stretcher pivot bridge. 3,752,440, Cl. 254-62.000.
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Reed, Chester L., to United States of America, Navy. Three axis simulator. 3,752,429, Cl. 248-179.000.
Reed, William A.; Kinzer, William K.; Swanson, John J.; and Kusner, Robert E., to Republic Steel Corporation. Apparatus for producing metal powder. 3,752,611, Cl. 425-7.000.
Rees, Alfred, to Lucas, Joseph, (Industries) Limited. Ignition distributors. 3,752,140, Cl. 123-146.50a.
Reese, Mary Catholeene: *See—*
Reese, William M., Sr., 3,751,988.
Reese, William M., Sr., to Reese, Mary Catholeene. Differential pressure responsive device. 3,751,988, Cl. 92-37.000.
Reeves, Billy Joe; and Chanlly, James L. Fish scaler device. 3,751,765, Cl. 17-64.000.
Regie National des Usines Renault: *See—*
Bauchet, Pierre; and Carre, Jean-Claude, 3,751,903.
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Regnier, Albert; and Silerme, Fernand, to International Standard Electric Corporation. Switching matrice crosspoint. 3,753,176, Cl. 335-112.000.
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Reick, Otto, Jr. Gripping device. 3,752,524, Cl. 294-25.000.
Reimink, Ronald L.: *See—*
Boenke, Clyde A.; Reimink, Ronald L.; and Jackson, James A., 3,752,908.
Reiner, Kenneth. Fastening devices. 3,751,769, Cl. 24-73.0es.
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Remke Incorporated: *See—*
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Remke, Theodore Karl; and Muller, Russell V., to Remke Incorporated. Beverage truck. 3,752,529, Cl. 296-24.00r.
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Renaud, Yves, to Compagnie des Lampes. Discharge lamp electrode. 3,753,028, Cl. 313-346.00r.

Renchen, Frank. Mobile home anchor. 3,751,866, Cl. 52-149.000.

Rennard, Raymond J., Jr.: *See—*
Kehl, William L.; and Rennard, Raymond J., Jr., 3,752,878.

Rennie, John Coyne. Coordinated precise position pollution detecting. 3,751,984, Cl. 73-421.00r.

Renoux, Robert A. Apparatus for pressing objects out of thermoplastic material, and particularly phonographic disks. 3,752,620, Cl. 425-174.200.

Rentschler, Waldemar T., to Prontor-Werk Alfred Gauthier GmbH. Camera apparatus having flashbulb and shutter control. 3,752,049, Cl. 95-11.001.

Republic Steel Corporation: *See—*
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Retallick, David Arthur. Laminated flow element. 3,752,187, Cl. 137-608.000.

Reynolds, George A.; Tuccio, Sam A.; Peterson, Otis G.; and Specht, Donald P., to Eastman Kodak Company. Visible spectrum dye lasers. 3,753,146, Cl. 331-94.500.

Reynolds, Jerald James, to International Business Machines Corporation. Solder terminal rework technique. 3,751,799, Cl. 29-574.000.

Reynolds Metals Company: *See—*
Arfert, Horst F. W., 3,752,387.
Cvacho, Daniel S.; and Wallace, Joseph W., 3,751,962.
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Reynolds, R. J., Tobacco Company: *See—*
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Rheimpreussen AG: *See—*
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Rheinstahl Huttenwerke AG: *See—*
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Rhoades, Henry W. Animal handler. 3,752,126, Cl. 119-103.000.

Rhoda, Ralph A., to Berkeley Pump Company. Afterplane for marine jet-powered boats. 3,752,110, Cl. 115-16.000.

Rhodes, Alex: *See—*
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Rice, Paul Patrick. Pressure-to-electric transducer. 3,753,199, Cl. 338-42.000.

Richardson, Carl: *See—*
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Richardson Company, The: *See—*
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Richardson, Wallace L., to Chevron Research Company. Nonionic surfactant as a demulsifier for amine containing fuel detergents. 3,752,657, Cl. 44-72.000.

Richter, Ole J., to Kamyr Aktiebolag. Strainer device in a continuous cellulose digesting plant. 3,752,319, Cl. 210-357.000.

Richter, Stanley H. Aircraft. 3,752,419, Cl. 244-23.00c.

Ricketts, Alan W., Jr.; Devault, Allan T.; Doane, Russell C.; Dumser, John M., Jr.; and Holzer, John M., Jr., to Digital Equipment Corporation. Programmable machine controller. 3,753,243, Cl. 340-172.500.

Ricoh Co. Ltd.: *See—*
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Riddle, Dennis L.: *See—*
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Righi, Nardino. Cassette tape-read out devices. 3,752,488, Cl. 274-4.00e.

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Riomdel, Pierre, to Societe Anonyme des Ateliers de Secheron. Automatic operation control device of an automotive vehicle. 3,752,084, Cl. 105-61.000.

Riordan, John D.: *See—*
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Risener, George A. Liquid handling method and apparatus. 3,752,362, Cl. 222-85.000.

Risko, John Joseph: *See—*
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Rixson-Firemark Inc.: *See—*
Roberts, Frank D., 3,752,208.

Robert, Michel, to Carnaud, J. J., & Forges de Basse-Indre, S.A. Container spout and pouring nozzle. 3,752,369, Cl. 222-481.000.

Roberts, Frank D., to Rixson-Firemark Inc. Closure operator. 3,752,208, Cl. 160-1.000.

Roberts, Henry J.; and Davis, Willard F., to Thiokol Chemical Corporation. Release connector for a riser of a parachute flare. 3,752,077, Cl. 102-35.000.

Roberts, James C., Jr.; and Nelson, Hersey B., to Combustion Engineering, Inc. Method of erection of horizontal surfaced heat transfer modules for steam generating units. 3,751,783, Cl. 29-157.400.

Roberts, Richard W., to Borg-Warner Corporation. Variable speed friction drive transmission. 3,752,000, Cl. 74-190.500.

Robertshaw Control Company: *See—*
Hamilton, Robert M.; and Anderson, Walter R., 3,752,175.

Robertson, Elmer L.: *See—*
Hafele, Robert X.; and Robertson, Elmer L., 3,752,628.

Robertson, Harry L. Airless liquid spraying device. 3,752,368, Cl. 222-327.000.

Robinson, Melville W., Jr.; and Jaco, Charles M., Jr., to Dravo Corporation. Industrial bulk material transportation. 3,752,334, Cl. 214-41.000.

Robinson, Worden. Portable gas fired art pottery kiln and method. 3,752,643, Cl. 432-120.000.

Roche, William J., to GTE Sylvania Incorporated. Integrated fluorescent lamp unit. 3,753,036, Cl. 315-60.000.

Roe, Elverton O.; and Moore, Charles Gregg, to Wooster Brush Company, The. Hand held roller frame. 3,751,748, Cl. 15-230.110.

Rogers, John E. Vehicle wheel elevating and leveling device. 3,752,441, Cl. 254-88.000.

Roller Bearing Company of America: *See—*
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Rollins, Lester G.; and McDowell, Glenn S. Coal cutting using more teeth for sumping than shearing. 3,752,534, Cl. 299-10.000.

Ron, Benjamin, to Shiber, Samuel, Circle. Hydraulic power brake booster motor. 3,751,919, Cl. 60-54.50p.

Rono-Clausen, Jorgen: *See—*
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Ronson Corporation: *See—*
Norman, David; and Soane, Keith, 3,752,637.

Roscoe, Henry George; Blickens, Donald Arthur; and Kupfer, David, to American Cyanamid Company. Method for inhibiting gastric acid secretion in mammals. 3,752,893, Cl. 424-270.000.

Rosenlund, Iver T., to Du Pont de Nemours, E. I., and Company. Exhaust gas reactor. 3,751,920, Cl. 60-282.000.

Rosenthal, Arthur: *See—*
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Ross, John R. Powder measurement and dispensing apparatus. 3,752,033, Cl. 86-31.000.

Ross, Warren N. Irrigation carriage. 3,752,495, Cl. 280-80.00r.

Ross, William D.; and Roushdy, Hesham A., to Ford Motor Company. Power transmission mechanism having a torque sensitive pressure regulator valve. 3,752,012, Cl. 74-731.000.

Rosser, Daniel B., to General Electric Company. Rectifier bridge assembly comprising stack of high-current PN semiconductor wafers in a sealed housing whose end caps comprise AC terminals of the bridge. 3,753,052, Cl. 317-234.00r.

Rossitto, Conrad; and Taylor, David B., to USM Corporation. Polyurethane polyureas. 3,752,786, Cl. 260-33.4vr.

Rossnan, Michael. Fishing hook. 3,751,844, Cl. 43-36.000.

Rosta, William N., to ULM Corporation, The. Anti-torque system for tip driven rotor blades. 3,752,418, Cl. 244-23.00c.

Roth, Willy: *See—*
Varsanyi, Denis; and Roth, Willy, 3,752,811.

Rouban, Basile, to Trayrou S. A. Weight-measuring unit. 3,752,244, Cl. 177-1.000.

Rouichaud, Robert, to Texas Instruments, Incorporated. Disposable medical electrode with laminate contact member. 3,752,151, Cl. 128-2.06r.

Roulard, Rene Andre Louis: *See—*
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Roumanos, William P.: *See—*
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Roushdy, Hesham A.: *See—*
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Rowe International, Inc.: *See—*
Harris, John A., 3,752,357.

Rowe, John J., to Singer Company, The. Pseudosynchronous counter. 3,753,127, Cl. 328-42.000.

Rowley, Kermit G., to Tenneco Oil Company. Device for forming a flow restriction in a flow conductor. 3,751,964, Cl. 72-470.000.

Roy, Upendra; Otto, Guenther H.; and Reece, Orvil Y., to United States of America, National Aeronautics and Space Administration. Synthesis of superconducting compounds by explosive compaction of powders. 3,752,665, Cl. 75-135.000.

RTE Corporation: *See—*
Link, Edwin A., 3,753,203.

Ruble, Emerson J., to Portec, Inc. Rail anchor. 3,752,397, Cl. 238-327.000.

Ruble, Frank D.; West, Terence H.; and Sordello, Frank J., to Information Storage Systems, Inc. Thermal expansion compensation for disc drive memory. 3,753,254, Cl. 340-174.10b.

Rubner, Hugo G., to Briggs & Stratton Corporation. Compact cylinder lock. 3,751,952, Cl. 70-368.000.

Ruddell, James Nelson, to Lambeg Industrial Research Association. False twisting of yarns. 3,751,894, Cl. 57-34.0hs.

Rudnicki, William E.: *See—*
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Ruedi, Ernst: *See—*
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Rufer, Clemens; Schroder, Eberhard; and Kessler, Hans-Joachim, to Schering Aktiengesellschaft. 3-(5-Nitro-2-imidazolylmethylenamino)-2-oxazolidinones. 3,752,809, Cl. 260-240.00a.

Ruffet, Pierre: *See—*
Bermann, Francis; Courtaud, Paul; Dioux, Claude; Manifacier, Andre; Raboeuf, Andre; and Ruffet, Pierre, 3,752,985.

Ruge, Jurgen; and Eggers, Heiner, to Steigerwald Strahltechnik GmbH. Process for precision setting of the electron beam in electron beam welding. 3,752,952, Cl. 219-121.0em.

Runnells, Robert R.; and Longson, Frank W., to MDT Instrument Company. Method for preventing air embolism in a syringe for angiorapic power injector. 3,752,145, Cl. 128-2.00r.

Runnels, Joe N.; and Strandbygaard, Svend, to Boeing Company, The. Jet augmented ram air scoop. 3,752,422, Cl. 244-118.00r.

Runyan, Wesley D.: *See—*
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Russell, Ronald W.: *See—*
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Rust, Kurt: *See—*
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Rutkowski, Marian; and Wieckowska, Jadwiga, to Politechnika Wroclawska. Method of forming of the wet fines and coal silts and an equipment suitable for applying the method. 3,752,656, Cl. 44-2.000.

Rutkowski, Michael D.; and Thompson, Richard R., to Pro-Tech, Inc. Liquid sampling. 3,751,983, Cl. 73-421.00b.

Ryan, James M.; and Richardson, Carl, to Abcor Inc. Process control. 3,751,966, Cl. 73-23.100.

Rydberg, Sigge. Heat engines. 3,751,904, Cl. 60-24.000.

S.A. Texaco Belgium N.V.: *See—*
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Saarbergwerke Aktiengesellschaft: *See—*
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Sackman, David J.: *See—*
Kiffmeyer, William W.; and Sackman, David J., 3,753,246.

Safran, Paul, to Emerson Electric Co. Reciprocal ferrite phase shifter having means detecting deviations of the energy from desired linear polarization. 3,753,160, Cl. 333-17.000.

Saftien, Udo: *See—*
Enke, Kurt; Bauer, Klaus; and Saftien, Udo, 3,752,497.

Sage, Alexander. Valve with controlled flow characteristics. 3,752,188, Cl. 137-625.120.

Saidla, Glen W., to Dana Corporation. Mold capable of being opened and closed. 3,752,437, Cl. 249-172.000.

Sailer, Henry, to United States of America, Navy. Digital two-speed motor control. 3,753,066, Cl. 318-305.000.

S.A.I.P. (S.p.A.): *See—*
Blanchi, Torreno, 3,751,956.
Blanchi, Torreno, 13,751,956.

Saito, Nobuo; Ito, Kiyoo; Watanabe, Yutaka; and Yamaguchi, Kunihiko, to Hitachi, Ltd. Bysolar driving method and device for a magnetic thin film memory. 3,753,251, Cl. 340-174.000.

Sakakibara, Naoji, to Aisin Seiki Kabushiki Kaisha. Method and apparatus for control of a vehicle constant speed mechanism. 3,752,252, Cl. 180-105.00e.

Sakamoto, Yoichi, to Matsushita Electric Industrial Co. Ltd. Varactor tuning system having means to maintain terminal voltage of varactor busing capacitor within desired range. 3,753,172, Cl. 334-15.000.

Sakuta, Masaaki; and Ishida, Toshimasa, to Oki Electric Industry Co., Ltd. Method of manufacturing semiconductor elements by liquid phase growing method. 3,752,713, Cl. 148-171.000.

Salatiello, Peter P.: *See—*
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Salge, Jurgen: *See—*
Kind, Dieter; Hartel, Hagln; Salge, Jurgen; and Brilka, Rudolf, 3,753,042.

Salisky, Sallyann Zanca, to International Playtex Corporation. Girdle with multi-region abdominal control. 3,752,164, Cl. 128-547.000.

Sambhu, Mahesh K.; and Hinchey, John J., to Beckman Instruments, Inc. Guarded oil test cell with triaxial connector. 3,753,098, Cl. 324-65.00p.

Sandel Industries, Inc.: *See—*
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Sandoz Ltd.; a/k/a Sandoz AG: *See—*
Fluckiger, Edward; Troxler, Franz; and Hofmann, Albert, 3,752,814.
Fluckiger, Edward; Troxler, Franz; and Hofman, Albert, 3,752,888.
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Santa Fe International Corporation: *See—*
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Santleben, Hans-Wolfgang: *See—*
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Santullo, Vincent F.; Manos, George; Gazzo, John J., Jr.; and Roumanos, William P., to Porta Systems Corporation. Line verification tester. 3,752,940, Cl. 179-175.20r.

Sanyo Electric Co., Ltd.: *See—*
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Sargent, Charles L.; Miller, Marshall W.; and Adiska, Gary R., to Thetford Corporation. Recirculating toilet with filter screen assembly. 3,751,735, Cl. 4-10.000.

Sarnes, Myron C.: *See—*
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Sasabe, Kaoru: *See—*
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Sasse, Joachim, to Chemiebau, Dr. A. Zieren, GmbH & Co., KG. Gas drying and SO_3-absorption for sulfuric acid production. 3,752,884, Cl. 423-522.000.

Sato, Harunori: *See—*
Kurahashi, Koichiro; Nakada, Masancri; Sato, Harunori; Nishimura, Koichi; and Abe, Masaaki, 3,752,918.

Sato, Kenji; Yamazaki, Kanji; and Tanaka, Isami, to Tsudakoma Industrial Co., Ltd. Loading balancer. 3,752,325, Cl. 212-35.00r.

Sato, Masanobu, to Olympus Optical Co., Ltd. Photographic camera having a flash synchronizing device. 3,752,046, Cl. 95-11.50r.

Sato, Masao; and Iwaida, Hideaki, to Nippon Kogaku K.K. Optical scale reading device in measuring instrument. 3,752,562, Cl. 350-113.000.

Satzinger, Gerhard: *See—*
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Sawhney, Dulari L.: *See—*
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Sayigh, Adnan A. R.; Stuber, Fred A.; and Ulrich, Henri, to Upjohn Company, The. Process for bonding polyurethane to substrate. 3,752,694, Cl. 117-93.310.

Scaglia, Carlo: *See—*
Cozza, Giorgio; Scaglia, Carlo; and Barilli, Filippo, 3,752,879.

Scanlan, Raymond J. Automatic processor for emulsion coated metal templates. 3,752,054, Cl. 95-94.00r.

Scardiglia, Frank; and Kiss, Kornel D., to Dart Industries, Inc. Electrical cables insulated with extraction resistant stabilized polymers. 3,752,865, Cl. 260-848.000.

Schaeffer, William. Lifting and/or rotating body constituting a kite. 3,752,423, Cl. 244-153.00r.

Schainbaum, Julius, to Smith Kline & French Laboratories. Peak detector. 3,753,109, Cl. 324-103.00p.

Schaller, Robert L.; and Lamb, Michael W., to Sundstrand-Engelberg, Inc. Automatic work rest blade changer for centerless grinder. 3,751,858, Cl. 51-238.0gg.

Scharf, Alfred: *See—*
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Scheffel, Bernd, to Scheffel, Walter. Device for supplying strip-like fabric by means of rollers. 3,752,378, Cl. 226-183.000.

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Scheibe, Elias W., to General Motors Corporation. Mechanical valve lifter. 3,752,130, Cl. 123-90.052.

Scheidt & Bachmann GmbH: *See—*
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Schell, Raymond A., to Ethyl Corporation. Preparation of aldehydes from olefins. 3,752,859, Cl. 260-604.0hf.

Schellenberg, Rolf: *See—*
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Schenectady Chemicals Incorporated: *See—*
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Scherer, Otto; Korinth, Jurgen; and Frisch, Peter, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Fluorination of aliphatic compounds. 3,752,850, Cl. 260-544.00f.

Schering Aktiengesellschaft: *See—*
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Schiess Aktiengesellschaft: *See—*
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Schildkraut, Elliot R., to Block Engineering, Inc. Attenuated total reflection spectroscopic device. 3,752,584, Cl. 356-74.000.

Schilke, August W. Auto hood remover and installer. 3,752,463, Cl. 269-17.000.

Schilling, Robert G., Jr., to Chemical Instruments Corporation. Material analyzing apparatus. 3,751,977, Cl. 173-101.000.

Schindele, Alfred, to Terrot, C., Sohne, Maschinenfabrik. Apparatus for controlling the jacks and needles of circular knitting machines. 3,751,943, Cl. 66-42.000.

Schipper, Phillip: *See—*

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Schlosser, Karl, to Siemens Aktiengesellschaft. Circuit for determining the frequency assigned to a markable instant of a frequency-modulated transmitter. 3,753,118, Cl. 325-134.000.
Schlumberger Instruments et Systemes: *See*—
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Schmalzbach, Edwin Lewis: *See*—
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Schmalzbach, Edwin Lewis, to Hoffman-La Roche Inc. Dual bag blood pressure cuff. 3,752,148, Cl. 128-2.05c.
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Schmidt, Heinrich K., to Roller Bearing Company of America. Roller having retaining end plate and seal. 3,752,543, Cl. 308-187.200.
Schmidt, Helmut J.: *See*—
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Schmidt, John E.: *See*—
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Stephenson, Orlando W., III; and Schmidt, John E., 3,752,757.
Schneider, Frank. Baking battery. 3,752,640, Cl. 432-56.000.
Schneider, Hans-Dieter, to Bosch, Robert, Fernschamlozen Gesellschaft mit beschrankter Haftung. Gamma control in the luninance channel of a color television transmitter. 3,752,905, Cl. 178-5.40r.
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Schnurmann, Rudolf; and Brandts, Klaus, to Scheidt & Bachmann GmbH. Monitoring system. 3,753,226, Cl. 340-146.10c.
Schoeps, Knut Christian, to Atlas Copco Aktiebolag. Socket retaining means. 3,752,514, Cl. 287-53.00r.
Schor, Ferdinand William, to AMP Incorporated. Low pass filter network. 3,753,168, Cl. 333-70.00s.
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Schultes, Herbert; and Schlagheck, Norbert, to Agfa-Gevaert Aktiengesellschaft. Apparatus for storing photographic films and prints. 3,751,874, Cl. 53-59.00r.
Schulthess, Carl William, to Union Carbide Corporation. Laser oscillator-amplifier system. 3,753,147, Cl. 331-94.500.
Schwab, Johann; Zehner, Albert; Kratochvil, Egon; and Walter, Friedrich, 1/2 each to Aktiengesellschaft and Desma-Werke Gesellschaft mit beschrankter Haftung. Apparatus for mixing and conveying materials. 3,752,449, Cl. 259-191.000.
Schwartz, George F.: *See*—
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Schweinhammer, Manfred: *See*—
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Seay, Orum E.; and Shelton, Robert Q., to Halliburton Company. Hydraulic cushioning apparatus for railway cars. 3,752,329, Cl. 213-8.000.
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Seiler, Bernhard, to Hartmann, Emil. Method of and apparatus for making flat plastic tubing. 3,752,724, Cl. 156-351.000.
Seiple, Ronald L. Ecologically controlled ship's hull reconditioner. 3,752,109, Cl. 114-222.000.
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Shaw, Joseph Denman. Programmed dispensers. 3,752,359, Cl. 221-5.000.
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Shoh, Andrew, to Branson Instruments, Incorporated. Vibratory welding apparatus. 3,752,380, Cl. 228-1.000.

Short, Joe T., to Deering Milliken Research Corporation. Strand delivery means. 3,752,094, Cl. 112-79.00a.

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Shuman, Robert A., to Woodall Industries Inc. Floating duck or the like and floatation unit for use therewith. 3,752,102, Cl. 114--50f.

Shumate, Paul William, Jr., to Bell Telephone Laboratories, Incorporated. Trigger circuit for recording and transmitting sampled analog waveforms. 3,753,133, Cl. 328-151.000.

Siburn, Gene E., to International Paper Company. Resilient packaging spacer. 3,752,384, Cl. 229-14.00c.

Sick, Erwin; Pinior, Gernot; and Plockl, Johann, to Zellweger AG Apparate -und Maschinenfabriken Uster. Reading apparatus for optically discernible characters. 3,752,999, Cl. 250-219.00d.

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Sill, Clark D., Remotely operated air brake bleeding apparatus. 3,752,539, Cl. 303-68.000.

Silverman, Daniel. Information systems using arrays of multiple spot patterns. 3,753,249, Cl. 340-173.01r.

Simard, Joseph R. Oil separator apparatus and method for low miscibility refrigerant systems. 3,751,936, Cl. 62-84.000.

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Singer, Malcolm S., to Chevron Research Company. N-(1-Azido-2,2,2-trihaloethyl) azides and carbamates as nematocides. 3,752,890, Cl. 424-226.000.

Singh, Balwant, to American Cyanamid Company. Material containing photosensitive halo azido naphthalenes. 3,752,671, Cl. 96-91.00n.

Sink, William Howard, to Dana Corporation. Self-adjusting clutch. 3,752,286, Cl. 192-111.00a.

Sinn, Richard; and Schellenberg, Rolf, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Apparatus for production of polyamide moldings. 3,752,623, Cl. 425-206.000.

Slade, William J., to Campbell Soup Company. Can end. 3,752,353, Cl. 220-54.000.

Slague, Edward, to Picker Corporation. Photo timer. 3,752,991, Cl. 250-460.000.

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Slatin, Harvey L.; and Hirsch, Stanley, to Harstan Chemical Corporation. Portable plating kit. 3,752,752, Cl. 204-194.000.

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Sletzinger, Meyer: *See—*
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Slitanakis, George P., to Allegheny Ludlum Industries, Inc. Electrical device casing materials. 3,753,187, Cl. 336-90.000.

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Smaller, Philip. Apparatus for holding magnetic tapes in intimate contact. 3,752,925, Cl. 179-100.20e.

Smaller, Philip. Long wavelength signal enhancement for contact magnetic transfer recording. 3,752,926, Cl. 179-100.20e.

Smerz, Otto; Weckler, Gerhard; Scharf, Alfred; and Linke, Werner, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Dye levelling on and oligomer removal from polyester fibers and cellulose or polyamide blends with fatty acid dieste of butanediol-ethylene oxide condensate. 3,752,649, Cl. 8-169.000.

Smirnov, Vasily Ivanovich; deceased (by Epshtein, Yakov Veniaminovich; and Grigorievich, Solomon; administrators); Ivanov, Sergei Mikhailovich; and Belyaev, Nikolai Petrovich. Device for molding sheets of glass-reinforced plastics. 3,752,728, Cl. 156-577.00.

Smith, Chester A. M., to Canadian Patents and Development Limited. Stowable freight restraining apparatus. 3,752,086, Cl. 105-369.00b.

Smith, Courtland N., Jr.; and Verhagen, Edward L., to Sherman Car Wash Equipment Co. Rotary brush apparatus. 3,751,745, Cl. 15-183.000.

Smith, Donald K. Fishing lure. 3,751,842, Cl. 43-42.110.

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Smith, John Frederick, to Du Pont de Nemours, E. I., and Company. Blend of sol and gel chloroprene polymers. 3,752,785, Cl. 260-32.80a.

Smith, Judson L. Vacuum cleaner having a foam generator. 3,751,755, Cl. 15-302.000.

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Smith, Robert McKee, to Bell Telephone Laboratories, Incorporated. Magnetic domain switching matrix and control arrangement. 3,753,253, Cl. 340-174.0tf.

Smith, Sally J. Portable wardrobe refresher. 3,752,373, Cl. 223-51.000.

Smith, Ward C., to Corning Glass Works. Identification system. 3,751,835, Cl. 40-21.00c.

Smith, William Novis, Jr., to Foote Mineral Company. Preparation of tetrolic acid. 3,752,848, Cl. 260-526.00n.

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Snead, William K., to PPG Industries, Inc. Process for production of azides. 3,752,881, Cl. 423-410.000.

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Societe Anonyme dite: Societe Europeenne de Propulsion: *See*—
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Solomon, Raymond; and De Fevere, Dennis, to Fairchild Camera and Instrument Corporation. Apparatus for liquid epitaxy. 3,752,118, Cl. 118-422.000.
Soltanoff, Louis. Label, method and system for baggage handling. 3,752,312, Cl. 209-111.700.
Sommer, Alfred Hermann, to RCA Corporation. Electron emissive device incorporating a secondary electron emitting material of antimony activated with potassium and gesium. 3,753,023, Cl. 313-103.000.
Songco, Evelyn M.: *See*—
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Speer, Eugene. Motor vehicle automatic impact braking system. 3,752,250, Cl. 180-92.000.
Speer, Eugene M. Automotive vehicle impact energy reducing bumper. 3,752,522, Cl. 293-60.000.
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Spoel, Han, to Alcan Research and Development Limited. Recovery of metal from glass cloth filters and the like. 3,752,662, Cl. 75-10.00r.
Sporer, Michael, to Honeywell Information Systems Inc. Memory control system adaptive to different access and cycle times. 3,753,232, Cl. 340-172.00s.
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Sproul, David Douglas, to Chicago Bridge & Iron Company. Jacket cooled header air distribution system for fluidized bed reactor. 3,752,224, Cl. 165-47.000.
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Stahle, Helmut; Koppe, Herbert; Kummer, Werner; and Santleben, Hans-Wolfgang, to Boehringer Ingelheim G.m.b.H. Substituted N-aminoalkyl-arylamino-imidazolines-(2). 3,752,810, Cl. 260-247.50r.
Stamm, Walter; and Greco, Carl C., to Stauffer Chemical Company. Method of preparing isocyanic acid and stabilizing same. 3,752,880, Cl. 423-365.000.
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Stephenson, Orlando W., III; and Schmidt, John E., to BASF-Wyandotte Corporation. Bipolar electrode seal at barrier sheet. 3,752,757, Cl. 204-256.000.
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Stevens, Curtis E., to Bertea Corporation. Acoustic control system. 3,753,221, Cl. 340-15.000.
Stevens, Daryl, to Clark Equipment Company. Hydraulic steering system. 3,752,248, Cl. 180-79.20r.
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Stiff, Rodney Allen, to Massey-Ferguson (Australia) Limited. Torque-limiting clutch. 3,751,941, Cl. 64-30.00e.
Stiles, Alvin B., to Du Pont de Nemours, E. I., and Company. Zirconia-silica-promoted cobalt oxide catalyst. 3,752,774, Cl. 252-462.000.
Stiles, Donald J., to International Business Machines Corporation. Back printer printline visibility control. 3,752,069, Cl. 101-93.00c.
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Stosberg, Herbert; Fleischmann, Horst; Reinhards, Gunter; and Engels, Siegfried, to Tente-Rollen Gesellschaft mit beschrankter Haftung Companie. Swivel castors, particularly for shopping trolleys. 3,751,757, Cl. 16-35.000.
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Stripling, William W.; and Hunter, Joe S., to United States of America, Army. Linear scanning seeker with single axis rotation. 3,752,998, Cl. 250-234.000.
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Sullivan, Norman M.; and Fitzgerald, Francis J., Jr., to Rapistan Incorporated. Cargo handling system and method. 3,752,339, Cl. 214-152.000.
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Touchstone, Roy Henry. Quick slack adjuster for locomotive brakes. 3,752,269, Cl. 188-197.000.
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Tuger, William H., to Wiggins, E. B., Inc. Coupler device for tubing ends providing mechanical and electrical connections therewith. 3,753,205, Cl. 339-15.000.
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Turmel, Hilaire Marcel; Lackie, Dorothy Ellen; and Chopra, Sohinder Nath. Process for making tufted pile carpet. 3,751,777, Cl. 28-72.00p.
Tutelman, David Morris, to Bell Telephone Laboratories, Incorporated. Distributed logic memory cell with source and result buses. 3,753,238, Cl. 340-172.500.
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National Aeronautics and Space Administration; Administrator; with respect to an invention of:
Austin, William E. Compton scatter attenuation gamma ray spectrometer. 3,752,986, Cl. 250-394.000.
Scott, Walter L. Sensing means for prosthetic limbs. 3,751,733, Cl. 3-1.100.
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Urbas, Wolfgang Dietrich, to Deutsche Texaco Aktiengesellschaft. Turbulent flow high-molecular liquid viscosimeter. 3,751,974, Cl. 73-54.000.

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Valdespino, Joseph M. Shock absorber structure including flexible bladder means. 3,752,270, Cl. 188-281.000.

Valva, Anthony A. Masons' line holder. 3,751,810, Cl. 33-86.000.

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Van Everdingen, Theodorus Michael J. Device for cutting a carpet. 3,752,025, Cl. 83-485.000.

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Van Manen, Dick T. Injection mold/injection blow mold system. 3,752,615, Cl. 425-130.000.

Van Manen, Dick T. Rotary paraxial-cavity reciprocable-core injection mold/injection blow mold system. 3,752,625, Cl. 425-249.000.

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Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Arnold, Thomas B., and D. R. Patterson. Method and apparatus for determining solids production from a well. T913,010, 8–14–73, Cl. 250—308.

Beausoleil, William F., to International Business Machines Corp. Dynamic shift register with static regeneration. T913,008, 8–14–73, Cl. 307—221.

Burpitt, Robert D., and R. H. Hasek. Process for the preparation of 2-styrylbenzoxazoles and 2-styrylbenzothiazoles. T913,001, 8–14–73, Cl. 260—240.

Carmichael, Keith S. Friction-welded bottom seals on thermoplastic bottles. T913,002, 8–14–73, Cl. 264—68.

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Duram, Robert E. Method of tow splicing. T913,005, 8–14–73, Cl. 156—158.

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Siple, James C., to United States Steel Corp. Terne metal bath composition. T913,003, 8–14–73, Cl. 117—51.

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Hilbert, Oscar L. Perpetual calendar. 228,153, 8–14–73, Cl. D74—5.

Horgan, William J., Jr., to Blumcraft of Pittsburgh. Combined handle and lock housing. 228,115, 8–14–73, Cl. D8—138.

Horgan, William J., Jr., to Blumcraft of Pittsburgh. Combined panic device, handle, and lock housing set. 228,116, 8–14–73, Cl. D8—149.

Hunter, Harland J. Base for a pen holder or the like. 228,154, 8–14–73, Cl. D74—5.

Ishikawa, Haruo, to Kuraisura Denki Kabushiki Kaisha. Speaker cabinet. 228,139, 8–14–73, Cl. D26—14.

Jones, Melvin R.: *See*—
Skalka, Stanley H., and Jones. 228,103.

Kabushiki Kaisha Ricoh: *See*—
Hikawa, Kuji. 228,151.
Yamakawa, Hitoshi. 228,124.

Kawano, Takeyoshi: *See*—
Ohwada, Minoru, Kouda, Miyamoto, and Kawano. 228,138.

Kerman, Wilbur J., to Cubicon Corp. Phonograph record display unit. 228,108, 8–14–73, Cl. D6—185.

Kerman, Wilbur J., to Cubicon Corp. Merchandise display unit. 228,110, 8–14–73, Cl. D6—186.

Kitson, Gerald L. Reversible feed loader drive pulley. 228,118. 8–14–73, Cl. D8—220.

Kitson, Gerald L. Poultry cage feeder. 228,141, 8–14–73, Cl. D30—13.

Klemenhagen, Dale A.: *See*—
Lindquist, William C., Snyder, and Klemenhagen. 228,144.

Klotz, Jack., and L. Klotz, to Environmental Concepts Products Co., Inc. Table. 228,106, 8–14–73, Cl. D6—117.

Klotz, Jack, and L. Klotz, to Environmental Concepts Products Co., Inc. Desk. 228,107, 8–14–73, Cl. D6—177.

Klotz, Louis: *See*—
Klotz, Jack, and L. 228,106.
Klotz, Jack, and L. 228,107.

Kouda, Hironosuke: *See*—
Ohwada, Minoru, Kouda, Miyamoto, and Kawano. 228,138.

Kramer, Ake S.B. Vacuum cleaning nozzle. 228,148, 8–14–73, Cl. D49—17

Kuhnl, Leopold K., to Warner-Lambert Co. Safety razor. 228,159, 8–14–73, Cl. D95—3.

Kuraisura Denki Kabushiki Kaisha: *See*—
Ishikawa, Haruo. 228,139.

La Bonte, Claudette A. Door knocker. 228,120, 8–14–73, Cl. D8—277.

Lee, Herbert P., to Wilton/Lee, Ltd. Decorative panel. 228,111, 8–14–73, Cl. D6—192.

Lewis, Ronald E.: *See*—
Fernandez, Mario F., and Lewis. 228,127.

Lindquist, William C., M. F. Snyder, and D. A. Klemenhagen, to Toro Mfg. Corp. Comb for turf machines and the like. 228,144. 8–14–73, Cl. D40—1.

Lippert, Wayne M., and W. L. Lippert. Bathtub. 228,133, 8–14–73, Cl. D23—55.

Lippert, William L.: *See*—
Lippert, Wayne M., and W. L. 228,133.

Magill, John W. Airport. 228,126, 8–14–73, Cl. D13—1.

Mannina, Joseph P. Play board for a game. 228,142, 8–14–73, Cl. D34—5.

Master Industries, Inc.: *See*—
Turner, Ronald P. 228,117.

Matsushita Electric Industrial Co., Ltd.: *See*—
Ohwada, Minoru, Kouda, Miyamoto, and Kawano. 228,138.

Matwey, Paul, to GAF Corp. Diazo copying machine, or similar article. 228,152, 8–14–73, Cl. D61—1.

Miyamoto, Masaaki: *See*—
Ohwada, Minoru, Kouda, Miyamoto, and Kawano. 228,138.

Modelevsky, Ian C., B. S. De Young, D. Nevins, and M. A. Stern, to Bristol-Myers Co. Vitamin tablet or similar article. 228,128, 8–14–73, Cl. D16—3.

Modelevsky, Ian C., B. S. De Young, D. Nevins, and M. A. Stern, to Bristol-Myers Co. Vitamin tablet or similar article. 228,129, 8–14–73, D16—3.

NASTA Industries, Inc.: *See*—
Spiegel, Norman. 228,143.

Nelson, Denis H.: *See*—
Schachet, Eli, and Nelson. 228,130.

Nevins, Donald: *See*—
Modelevsky, Ian C., De Young, Nevins, and Stern. 228,128.
Modelevsky, Ian C., De Young, Nevins, and Stern. 228,129.

Norris, Lyell B., Jr.: *See*—
Shreve, Arthur L., III, Norris, Jr., and Beichler. 228,122.

O'Brien, Gerald J. Teaching device. 228,134, 8–14–73, Cl. D25—1.

Ohwada, Minoru, H. Kouda, M. Miyamoto, and T. Kawano, to Matsushita Electric Industrial Co., Ltd. Head-phone. 228,138, 8–14–73, Cl. D26—14.

Pawsat, Carlton P., to Wald Mfg. Co., Inc. Plastic reflector pedal. 228,158, 8–14–73, Cl. D90—14.

Portugal, Ronald J., to E1 Instruments Inc. Breadboard for electronic components or the like. 228,136, 8–14–73, Cl. D26—1.

Ralston, Philip G., Jr., to Baxter Laboratories, Inc. Sealed container for storing parenteral and other solutions. 228,155, 8–14–73, Cl. D83—1.

Richter, Victor J. Combined flag and holder therefor. 228,140, 8–14–73, Cl. D29—17.

Romancky, George A. Picture frame. 228,113, 8–14–73, Cl. D6—244.

Schachet, Eli, and D. H. Nelson, to Sherwood Medical Industries Inc. Dental aspirator control. 228,130, 8–14–73, Cl. D24—1.

Schwartz, Randall H. Decorative lamp. 228,146, 8–14–73, Cl. D48—20.

Sherwood Medical Industries Inc.: *See*—
Schachet, Eli, and Nelson. 228,130.

Shore Plastics, Inc.: *See*—
Sussman, Morris. 228,157.

Shreve, Arthur L., III, L. B. Norris, Jr. and R. W. Beichler, to The Black and Decker Mfg. Co. Combined package and display carton for a power tool or the like. 228,122, 8–14–73, Cl. D9—191.

Skalka, Stanley H., and M. R. Jones, to Victor Stanley, Inc. Combined bar, chair and side table unit. 228,103, 8–14–73, Cl. D6—4.

Snyder, Merton F.: *See*—
Lindquist, William C., Snyder, and Klemenhagen. 228,144.

Spiegel, Norman, to NASTA Industries, Inc. Toy amusement park. 228,143, 8–14–73, Cl. D34—15.

Stanley, Victor, Inc.: *See*—
Skalka, Stanley H., and Jones. 228,103.

Stern, Morley A.: *See*—
Modelevsky, Ian C., De Young, Nevins, and Stern. 228,128.
Modelevsky, Ian C., De Young, Nevins, and Stern. 228,129.

Sussman, Morris, to Shore Plastics, Inc. Compact. 228,157, 8–14–73, Cl. D86—10.

Sway, Boris. Dispensing container. 228,121, 8–14–73, Cl. D9—2.

Telex Corp., The: *See*—
Haueter, Robert E. 228,135.

Toro Co., The: *See*—
Fernandez, Mario F., and Lewis. 228,127.

Toro Mfg. Corp.: *See*—
Lindquist, William C., Snyder, and Klemenhagen. 228,144.

Turner, Ronald P., to Master Industries, Inc. Ski rope holder. 228,117, 8–14–73, Cl. D8—158.

Wald Mfg. Co., Inc.: *See*—
Pawsat, Carlton, P. 228,158.

Warner-Lambert Co.: *See*—
Kuhnl, Leopold K. 228,159.

Waterbury Lock & Specialty Co.: *See*—
Bennett, Robert A. 228,149.

Weiss, Franklin W. Packing cup or the like. 228,125, 8–14–73, Cl. D9—220.

Wells, Richard L. Combined dental floss strip and molded pick end. 228,131, 8–14–73, Cl. D24—1.

Wilton/Lee, Ltd.: *See*—
Lee, Herbert P. 228,111.

Woods, Matthew B. Adjustable record holder. 228,109, 8–14–73, Cl. D6—185.

Yamakawa, Hitoshi, to Kabushiki Kaisha Ricoh. Bottle. 228,124, 8–14–73, Cl. D9—168.

CLASSIFICATION OF PATENTS

ISSUED AUGUST 14, 1973

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

2.1A	3,751,727
3R	3,751,728
114	3,751,729
	3,751,730
227	3,751,731
230	3,751,732

CLASS 3

1.1	3,751,733

CLASS 4

10	3,751,735
100	3,751,736
146	3,751,737
197	3,751,734
247	3,751,738

CLASS 5

12R	3,751,739
37	3,751,740
317R	3,751,742
343	3,751,741

CLASS 7

14.6	3,751,743

CLASS 8

21C	3,752,645
	3,752,646
	3,752,647
130.1	3,752,648
169	3,752,649
183	3,752,650

CLASS 10

78.13	3,751,837

CLASS 12

1A	3,751,744

CLASS 13

10	3,752,895
18	3,752,896
20	3,752,897

CLASS 15

1	3,751,746
50R	3,751,747
92	3,751,749
183	3,751,745
192	3,751,751
220A	3,751,750
230.11	3,751,748
231	3,751,752
237	3,751,753
250.42	3,751,754
302	3,751,755
306A	3,751,756

CLASS 16

35	3,751,757
	3,751,758
50	3,751,759
150	3,751,760

CLASS 17

1R	3,751,761
11R	3,751,762
11.1R	3,751,763
35	3,751,764
64	3,751,765
71	3,751,766

CLASS 19

.58	3,751,767
244	3,751,768

CLASS 23

230R	3,752,651
232E	3,752,652
283	3,752,653
284	3,752,654

CLASS 24

73ES	3,751,769
126C	3,751,772
204	3,751,770
248SL	3,751,771
263HA	3,751,773

CLASS 26

51.4	3,751,774

CLASS 28

1.4	3,751,775
2	3,751,776
72P	3,751,777
72.14	3,751,778

CLASS 29

25.15	3,751,779
90R	3,751,781
95R	3,751,780
	3,751,782
156.4R	3,751,784
157.4	3,751,783
182.5	3,752,655
267	3,751,785
401	3,751,786
421R	3,751,787
423	3,751,788
434	3,751,789
455	3,751,790
469	3,751,791
471.1	3,751,792
472.7	Re.27,733
515	Re.27,735
523	3,751,793
526	3,751,794
558	3,751,795
559	3,751,796
570	3,751,797
573	3,751,798
574	3,751,799
589	3,751,800
600	3,751,802
603	3,751,803
628	3,751,801

CLASS 30

169	3,751,804
220	3,751,805
294	3,751,806

CLASS 32

52	3,751,807

CLASS 33

27C	3,751,813
75R	3,751,808
80	3,751,809
86	3,751,810
141R	3,751,811
143M	3,751,814
146	3,751,815
178R	3,751,812
184.5	3,751,817
185R	3,751,816
375	3,751,818
389	3,751,819

CLASS 34

92	3,751,820
93	3,751,821
116	3,751,822
155	3,751,823
167	3,751,824

CLASS 35

6	3,751,825
9F	3,751,826
10	3,751,827
11	3,751,828
28.3	3,751,829
44	3,751,830
48B	3,751,831

CLASS 36

2.5AL	3,751,832
81	3,751,833

CLASS 37

142R	3,751,834

CLASS 40

21C	3,751,835
64	3,751,836
156	3,751,838
158R	3,751,839

CLASS 42

9	3,751,840
75A	3,751,841

CLASS 43

6	3,751,843
36	3,751,844
42.11	3,751,842
56	3,751,845

CLASS 44

2	3,752,656
72	3,752,657

CLASS 46

1K	3,751,847
1R	3,751,846
19	3,751,848
40	3,751,849
86	3,751,850
206	3,751,851

CLASS 47

34.13	3,751,852

CLASS 48

197FM	3,752,659
206	3,752,658

CLASS 49

89.15	3,751,999
127	3,751,853
260	3,751,854

CLASS 51

5	3,751,855
100R	3,751,856
215H	3,751,857
238GG	3,751,858
249	3,751,859
289R	3,751,860
316	3,751,861

CLASS 52

2	3,751,862
79	3,751,864
92	3,751,865
111	3,751,863
149	3,751,866
223	Re.27,732
426	3,751,867
650	3,751,869
656	3,751,870
731	3,751,868

CLASS 53

26	3,751,871
32	3,751,872
59R	3,751,873
	3,751,874
180	3,751,875
375	3,751,876

CLASS 54

6	3,751,877

CLASS 55

58	3,751,878
158	3,751,879
	3,751,880
236	3,751,882
248	3,751,883
267	3,751,884
	3,751,885
318	3,751,886
367	3,751,881

CLASS 56

8	3,751,887
13.6	3,751,889
16.4	3,751,890
130	3,751,888
228	3,751,891
344	3,751,892

CLASS 57

34HS	3,751,894
34R	3,751,893
52	3,751,895
87	3,751,896
144	3,751,897
156	3,751,898

CLASS 58

23TF	3,751,899
24R	3,751,900
58	3,751,901

CLASS 59

71	3,751,902

CLASS 60

19	3,751,903
24	3,751,904
39.02	3,751,906
39.05	3,751,905
39.09P	3,751,907
39.17	3,751,909
39.43	3,751,908
39.65	3,751,910
	3,751,911
54.5P	3,751,919
215	3,751,913
282	3,751,920
284	3,751,914
288	3,751,917
289	3,751,916
290	3,751,915
324	3,751,921
330	3,751,918
349	3,751,922
359	3,751,923
405	3,751,912
485	3,751,924

CLASS 61

1F	3,751,925
36R	3,751,926
42	3,751,929
46.5	3,751,930
53	3,751,931
72.1	3,751,932
72.4	3,751,927
72.5	3,751,928

CLASS 62

29	3,751,933
41	3,751,934
75	3,751,935
84	3,751,936
126	3,751,938
137	3,751,939
217	3,751,940

CLASS 64

30E	3,751,941
30L	Re.27,729

CLASS 66

14	3,751,942
42	3,751,943
64	3,751,944
86A	3,751,937

CLASS 68

5C	3,751,945
12R	3,751,946
210	3,751,947

CLASS 70

55	3,751,948
125	3,752,661
144	3,751,949
264	3,751,950
313	3,751,951
368	3,751,952
381	3,751,953

CLASS 71

88	3,752,660

CLASS 72

20	3,751,995
56	3,751,954
57	3,751,956
60	3,751,955
	3,751,957
	3,751,958
237	3,751,959
326	3,751,960
339	3,751,961
347	3,751,962
410	3,751,963
470	3,751,964

CLASS 73

19	3,751,965
23	3,751,967
	3,751,968
	3,751,969
23.1	3,751,966
36	3,751,970
37.9	3,751,971
40.7	3,751,989
45	3,751,973
45.4	3,751,972
49.7	3,751,978
54	3,751,974
59	3,751,975
67.3	3,751,994
67.9	3,751,976
101	3,751,977
160	3,751,981
194EM	3,751,980
194A	3,751,979
212	3,751,982
421B	3,751,983
421R	3,751,984
	3,751,991
422GC	3,751,992
423A	3,751,985
423R	3,751,990
425.4R	3,751,986
465	3,751,987
518	3,751,993

CLASS 74

53	3,751,996
89	3,751,997
89.15	3,751,998
190.5	3,752,000
404	3,752,002
409	3,752,001
434	3,752,003
443	3,752,004
480R	3,752,005
489	3,752,006
492	3,752,007
501R	3,752,008
645	3,752,009
687	3,752,010
731	3,752,011
	3,752,012
732	3,752,013
745	3,752,014
869	3,752,015

CLASS 75

10R	3,752,662
12	3,752,663
134N	3,752,664
135	3,752,665

CLASS 81

9.5B	3,752,017
64	3,752,016
147	3,752,018

CLASS 82

28R	3,752,019
36R	3,752,020
86	3,752,024

CLASS 83

5	3,752,021
13	3,752,022
27	3,752,023
485	3,752,025
589	3,752,026
613	3,752,027
685	3,752,028

CLASS 84

1.01	3,752,898
329	3,752,029
471	3,752,031

CLASS 85

46	3,752,030
80	3,752,032

CLASS 86

31	3,752,033

CLASS 89

1.5G	3,752,034
13R	3,752,035

CLASS 90

13C	3,752,036
24.3	3,752,037

CLASS 91

39	3,752,038
171	3,752,039
411A	3,752,040
416	3,752,041
485	3,752,053

CLASS 92

37	3,751,988

CLASS 93

58.2R	3,752,042
93DP	3,752,043

CLASS 95

1	3,752,044
10CT	3,752,045
11L	3,752,049
11	3,752,047
11.5R	3,752,046
	3,752,048
31FL	3,752,050
42	3,752,051
89R	3,752,052
94R	3,752,054

CLASS 96

1E	3,752,667
1	3,752,666
1.5	3,752,668
36.2	3,752,669
74	3,752,670
91N	3,752,671
100	3,752,672
108	3,752,674
140	3,752,673

CLASS 98

114	3,752,055
115LH	3,752,056

CLASS 99

91	3,752,675
100P	3,752,676
124	3,752,677
136	3,752,678
348	3,752,057

CLASS 100

32	3,752,058
37	3,752,059
38	3,752,060
49	3,752,061
93PB	3,752,062
97	3,752,063
98R	3,752,064
123	3,752,065
192	3,752,066

CLASS 101

37	3,752,067
93C	3,752,069
93	3,752,068
123	3,752,070
125	3,752,071
211	3,752,072
	3,752,073
269	3,752,074
415.1	3,752,075
450	3,752,076

CLASS 102

7.2	3,752,078
30	3,752,079
35	3,752,077
37.8	3,752,082
43R	3,752,080
70.2R	3,752,081

CLASS 105

1A	3,752,083
61	3,752,084
368R	3,752,085
369B	3,752,086

CLASS 106

38.3	3,752,689
38.35	3,752,679
	3,752,680
	3,752,681
55	3,752,683
57	3,752,682
58	3,752,684
288B	3,752,685
288Q	3,752,686
300	3,752,687
309	3,752,688

CLASS 108

59	3,752,087
152	3,752,088
161	3,752,089

CLASS 110

9R	3,752,090
184	3,752,091

CLASS 111

7	3,752,092

CLASS 112

75	3,752,093
79A	3,752,094
	3,752,095
79R	3,752,096
121.12	3,752,097
	3,752,098
121.27	3,752,099
143	3,752,100
200	3,752,101

CLASS 114

.5F	3,752,102
16R	3,752,103
20R	3,752,104
162	3,752,105

206R 3,752,106
210 3,752,107
221 3,752,108
222 3,752,109

CLASS 115

16 3,752,110
35 3,752,111
3,752,112

CLASS 116

114R 3,752,113

CLASS 117

8 3,752,690
38 3,752,691
68 3,752,692
75 3,752,693
93.31 3,752,694
98 3,752,695
100D 3,752,696
138.8E 3,752,698
138.8F 3,752,697
141 3,752,699
155R 3,752,700
201 3,752,701
217 3,752,702

CLASS 118

5 3,752,114
39 3,752,115
57 3,752,116
302 3,752,117
422 3,752,118
637 3,752,119

CLASS 119

1 3,752,120
3,752,121
14.04 3,752,122
17 3,752,123
72.5 3,752,124
83 3,752,125
103 3,752,126
109 3,752,127

CLASS 120

119CD 3,752,132

CLASS 123

8.09 3,752,128
73A 3,752,129
90.52 3,752,130
97B 3,752,131
119F 3,752,133
136 3,752,134
3,752,135
139AT 3,752,136
139R 3,752,137
3,752,138
146.5A 3,752,139
3,752,140
198DB 3,752,141

CLASS 124

24 3,752,142

CLASS 125

11A 3,752,143

CLASS 128

2A 3,752,146
2R 3,752,145
2S 3,752,144
3,752,150
2.05C 3,752,147
3,752,148
2.06E 3,752,151
12 3,752,149
21 3,752,152
24R 3,752,153
33 3,752,154
65 3,752,155
66 3,752,156
146.7 3,752,157
278 3,752,158
303.15 3,752,159
303.17 3,752,160
312 3,752,161
348 3,752,162
541 3,752,163
547 3,752,164

CLASS 131

10.5 3,752,165
261B 3,752,166

CLASS 133

3D 3,752,168
117.5 3,752,231

CLASS 134

3 3,752,169
37 3,752,170

CLASS 136

6B 3,752,704
13 3,752,705
24 3,752,706

CLASS 137

1 3,752,171
12 3,752,172
43 3,752,173
81 3,752,175
118 3,752,176
216 3,752,177
246.22 3,752,178
272 3,752,179
355.17 3,752,180
375 3,752,181
491 3,752,174
504 3,752,182
3,752,183
3,752,184
559 3,752,185
608 3,752,186
3,752,187
609 3,752,167
625.12 3,752,188
625.65 3,752,189
627.5 3,752,190
636.1 3,752,191
802 3,752,192
829 3,752,193

CLASS 139

79 3,752,194
124A 3,752,195
179 3,752,196

CLASS 140

92.1 3,752,198
123.6 3,752,199

CLASS 141

1 3,752,197

CLASS 144

1E 3,752,200
209A 3,752,201

CLASS 145

61L 3,752,202

CLASS 148

6.2 3,752,707
3,752,708
12 3,752,709
3,752,710
33.3 3,752,711
126 3,752,712
171 3,752,713
175 3,752,714
187 3,752,715

CLASS 149

19 3,752,703

CLASS 151

37 3,752,203

CLASS 152

219 3,752,204
243 3,752,205
330 3,752,206

CLASS 156

3 3,752,716
17 3,752,717
66 3,752,718
84 3,752,719
132 3,752,720
148 3,752,721
159 3,752,723
201 3,752,722
351 3,752,724
367 3,752,725
394 3,752,726
510 3,752,727
577 3,752,728

CLASS 157

13 3,752,207

CLASS 160

1 3,752,208
327 3,752,209

CLASS 161

1 3,752,729
7 3,752,730
164 3,752,731
165 3,752,732
170 3,752,733

CLASS 162

123 3,752,734

CLASS 164

82 3,752,210
89 3,752,211
93 3,752,212
113 3,752,213
156 3,752,214
252 3,752,215
3,752,216
281 3,752,217
3,752,218
282 3,752,219
3,752,220
338 3,752,221

CLASS 165

35 3,752,222
43 3,752,223
47 3,752,224
3,752,225
59 3,752,226
89 3,752,227
184 3,752,228

CLASS 166

72 3,752,229
98 3,752,230
285 3,752,232
308 3,752,233

CLASS 169

1A 3,752,234
2R 3,752,235

CLASS 172

180 3,752,238
531 3,752,237
699 3,752,239
751 3,752,236

CLASS 173

1 3,752,240
163 3,752,241

CLASS 174

35GC 3,752,899
52R 3,752,900
84C 3,752,901
163F 3,752,902

CLASS 175

108 3,752,242
364 3,752,243

CLASS 176

19R 3,752,735
36R 3,752,736
38 3,752,737
87 3,752,738

CLASS 177

1 3,752,244
208 3,752,245

CLASS 178

5.1 3,752,904
5.4CD 3,752,906
5.4EL 3,752,910
5.4R 3,752,905
5.6 3,752,907
3,752,908
6 3,752,912
3,752,913
6.6A Re.27,734
6.7R 3,752,914
3,752,915
6.8 3,752,911
3,752,917
7.088 3,752,919
7.2 3,752,918
7.3R 3,752,909
3,752,916
7.5R 3,752,903
22 3,752,920
66R 3,752,922
3,752,923

CLASS 179

1SA 3,752,929
1A 3,752,928
6R 3,752,930
15AL 3,752,932
15AQ 3,752,931
15BA 3,752,933
15BC 3,752,921
15BT 3,752,934
84R 3,752,924
99 3,752,936
100.2E 3,752,925
3,752,926
100.2S 3,752,935
3,752,937
100.2Z 3,752,938
107R 3,752,939
110A 3,752,941
146R 3,752,927
175.2R 3,752,940

CLASS 180

56 3,752,246
64R 3,752,247
68.5 3,752,254
79.2R 3,752,248
82R 3,752,249
92 3,752,250
104 3,752,251
105E 3,752,252
117 3,752,253

CLASS 181

.5AG 3,752,257
.5NP 3,752,255
.5XC 3,752,256
31B 3,752,258
33M 3,752,259
47R 3,752,260

CLASS 182

17 3,752,261
113 3,752,262
148 3,752,263

CLASS 187

9 Re.27,731
29R 3,752,264

CLASS 188

2F 3,752,265
170 3,752,266
171 3,752,267
181A 3,752,268
197 3,752,269
281 3,752,270
345 3,752,271
3,752,272
3,752,273

CLASS 191

49 3,752,274

CLASS 192

4A 3,752,275
53E 3,752,276
56R 3,752,277
3,752,278
84C 3,752,279
85AA 3,752,280
87.19 3,752,281
91R 3,752,282
99S 3,752,283
103F 3,752,284
105CD 3,752,285
111A 3,752,286

CLASS 194

10 3,752,287

CLASS 195

28R 3,752,739
3,752,740
66R 3,752,741
109 3,752,742
127 3,752,743

CLASS 197

1R 3,752,288
82 3,752,289
162 3,752,290
172 3,752,291

CLASS 198

25 3,752,292
30 3,752,293
33AA 3,752,294
34 3,752,295
94 3,752,296
127R 3,752,297
204 3,752,298
3,752,299
212 3,752,300

CLASS 200

33R 3,752,943
38B 3,752,944
83Y 3,752,942
166BB 3,752,945
166C 3,752,946
172A 3,752,947

CLASS 204

1T 3,752,744
105M 3,752,745
130 3,752,746
149 3,752,747
157.1R 3,752,748
180P 3,752,749
181 3,752,750
3,752,751
194 3,752,752
195S 3,752,753
225 3,752,755
228 3,752,754
252 3,752,756
256 3,752,757

CLASS 206

46FR 3,752,301
47A 3,752,306
48 3,752,307
48.5 3,752,308
52F 3,752,302
52R 3,752,303
58 3,752,304
63.2 3,752,309
65E 3,752,305
3,752,310

CLASS 209

72 3,752,311
111.7 3,752,312
169 3,752,313
173 3,752,314
240 3,752,315

CLASS 210

21 3,752,758
32 3,752,762
50 3,752,759
58 3,752,760
3,752,761
198 3,752,316
242 3,752,317
251 3,752,318
357 3,752,319
469 3,752,320
493 3,752,321

CLASS 211

41 3,752,322
132 3,752,323
153 3,752,324

CLASS 212

35R 3,752,325
47 3,752,326
55 3,752,327
145 3,752,328

CLASS 213

8 3,752,329

CLASS 214

1A 3,752,331
1Q 3,752,330
10.5R 3,752,332
13R 3,752,347
26 3,752,333
41 3,752,334
44B 3,752,335
75T 3,752,336
147G 3,752,337
147T 3,752,338
152 3,752,339
210F 3,752,457
314 3,752,340
3,752,341
450 3,752,342
505 3,752,343
508 3,752,344
515 3,752,345
621 3,752,346

CLASS 219

10.55 3,752,948
56 3,752,949
69V 3,752,950
73 3,752,951
121EM 3,752,952
137 3,752,953
203 3,752,348
413 3,752,954
3,752,955
505 3,752,956

CLASS 220

6 3,752,349
9G 3,752,350
9R 3,752,351
19 3,752,352
54 3,752,353
63R 3,752,354
86R 3,752,355
113 3,752,356

CLASS 221

5 3,752,359
17 3,752,357
90 3,752,358
125 3,752,360
251 3,752,361

CLASS 222

63 3,752,363
85 3,752,362
131 3,752,364
181 3,752,365
182 3,752,371
207 3,752,366
256 3,752,367
327 3,752,368
481 3,752,369
514 3,752,370
566 3,752,372

CLASS 223

51 3,752,373
111 3,752,374

CLASS 224

42.03B 3,752,375
42.45B 3,752,376

CLASS 225

3 Re.27,727

CLASS 226

3,752,377
119 3,752,379
183 3,752,378

CLASS 228

1 3,752,380
3,752,381
3 3,752,382
37 3,752,383

CLASS 229

14C 3,752,384
15 3,752,385
32 3,752,386
43 3,752,387
54R 3,752,388

CLASS 233

20R 3,752,389
26 3,752,390

CLASS 234

51 3,752,391

CLASS 235

7R 3,752,392
3,752,957
61.11D 3,752,962
61.11E 3,752,958
3,752,959
3,752,961
3,752,963
61.11H 3,752,960
92CA 3,752,964
136 3,752,965
150.1 3,752,966
150.22 3,752,967
151.11 3,752,968
3,752,969
151.34 3,752,393
152 3,752,970
164 3,752,971
174 3,752,394
196 3,752,972
197 3,752,973

CLASS 236

47 3,753,184

CLASS 237

46 3,752,395

CLASS 238

14 3,752,396
327 3,752,397

CLASS 239

1 3,752,398
101 3,752,399
116 3,752,400
132.3 3,752,402
204 3,752,403
265.35 3,752,401
308 3,752,404
413 3,752,405

CLASS 240

1EL 3,752,974
2W 3,753,217
2 3,752,975
2.25 3,752,406
10T 3,752,407
41.6 3,752,976
46.05 3,752,408
51.12 3,752,977

CLASS 241

60 3,752,409
69 3,752,410
189R 3,752,411

CLASS 242

56A 3,752,412
71.7 3,752,413
118.32 3,752,414
184 3,752,415
195 3,752,416

CLASS 244

12C 3,752,417
23C 3,752,418
3,752,419
77D 3,752,420
102SL 3,752,421
118R 3,752,422
153R 3,752,423
155R 3,752,424
321 3,752,425

CLASS 246

249 3,752,426

CLASS 248

19 3,752,427
48.2 3,752,428
179 3,752,429
226R 3,752,430
291 3,752,431
400 3,752,432

CLASS 249

94 3,752,433
105 3,752,434
106 3,752,435
145 3,752,436
172 3,752,437
184 3,752,438

CLASS 250

199 3,752,992
203R 3,752,993
213R 3,752,994
214R 3,752,995
219DF 3,752,996
219D 3,752,999
219S 3,752,997
234 3,752,998
261 3,752,984
270 3,752,988
333 3,752,983
336 3,752,987
340 3,752,978
368 3,752,981
3,752,982
375 3,752,979
394 3,752,986
401 3,752,989
460 3,752,991
472 3,752,985
503 3,752,990
552 3,752,980

CLASS 251

121 3,752,439

CLASS 252

8.5C 3,752,763
47.5 3,752,764
51.5A 3,752,765
57 3,752,766
59 3,752,767
182 3,752,768
301.1R 3,752,769
356 3,752,770

373 3,752,771
448 3,752,772
454 3,752,773
462 3,752,774
464 3,752,775
465 3,752,776

CLASS 254

62 3,752,440
88 3,752,441
185R 3,752,442

CLASS 259

1R 3,752,443
2 3,752,444
3 3,752,445
7 3,752,446
10 3,752,447
186 3,752,448
191 3,752,449

CLASS 260

2A 3,752,777
2.5R 3,752,784
22TN 3,752,778
23H 3,752,779
25 3,752,780
29.4R 3,752,781
29.6AN 3,752,782
29.6F 3,752,783
32.8A 3,752,785
33.4VR 3,752,786
41B 3,752,787
47UA 3,752,788
3,752,789
77.5AM 3,752,790
77.5AP 3,752,792
78SC 3,752,791
78.5T 3,752,793
88.1PA 3,752,794
88.2R 3,752,795
92.1 3,752,796
93.7 3,752,797
112.5 3,752,799
3,752,800
112.7 3,752,798
146T 3,752,801
192 3,752,802
210.5 3,752,803
211.5R 3,752,804
3,752,805
239.3D 3,752,806
239.57 3,752,807
240A 3,752,809
246B 3,752,811
247.5R 3,752,810
249.5 3,752,808
250R 3,752,812
256.4F 3,752,816
267 3,752,813
268PE 3,752,814
3,752,815
279R 3,752,817
287R 3,752,818
294.8B 3,752,820
295R 3,752,819
309.5 3,752,821
312R 3,752,856
315 3,752,822
3,752,823
326S 3,752,824
326.11 3,752,825
326.3 3,752,826
327TH 3,752,827
343 3,752,828
343.6 3,752,829
345.2 3,752,830
376 3,752,831
398.5 3,752,832
403 3,752,833
429.5 3,752,834
429.7 3,752,835
438.5R 3,752,836
446 3,752,837
453R 3,752,841
455A 3,752,838
465.4 3,752,842
465.7 3,752,840
465.8R 3,752,839
465.9 3,752,843
470 3,752,844
475P 3,752,846
482C 3,752,845
485F 3,752,847
526N 3,752,848
531R 3,752,849
544F 3,752,850
553DA 3,752,851
566A 3,752,852
583NH 3,752,853
584B 3,752,854
586H 3,752,855
604HF 3,752,859
615B 3,752,857
622R 3,752,858
632R 3,752,860
635D 3,752,861
676R 3,752,862
681 3,752,863
683.2 3,752,864
848 3,752,865
860 3,752,866
869 3,752,867
876R 3,752,868
936 3,752,870
938 3,752,871
943 3,752,869

CLASS 261

39B 3,752,451
39R 3,752,450
41B 3,752,454
52 3,752,452
94 3,752,453

CLASS 264

.5 3,752,872
78 3,752,873
176F 3,752,874

CLASS 266

3R 3,752,458
3,752,459
23H 3,752,460

CLASS 267

113 3,752,461
140 3,752,462

CLASS 269

17 3,752,463
32 3,752,464
93 3,752,465
201 3,752,466
321F 3,752,467

CLASS 270

57 3,752,468
61 3,752,469
80 3,752,470

CLASS 271

4 3,752,471

CLASS 272

60 3,752,472
62 3,752,473
80 3,752,474
83A 3,752,475

CLASS 273

1.5A 3,752,476
1.5R 3,752,477
73H 3,752,478
106A 3,752,479
109 3,752,480
131BA 3,752,481
176B 3,752,482

CLASS 274

4A 3,752,487
4C 3,752,486
4E 3,752,488
4F 3,752,483
3,752,484
3,752,485

CLASS 277

64 3,752,489
140 3,752,490

CLASS 280

11.35K 3,752,491
18 3,752,492
43.21 3,752,493
47.26 3,752,494
80R 3,752,495
81R 3,752,496
112A 3,752,497
124F 3,752,498
3,752,499
150AB 3,752,500
3,752,501
440 3,752,502

CLASS 281

17 3,752,503

CLASS 282

29B 3,752,504

CLASS 285

5 3,752,505
12 3,752,507
149 3,752,506
307 3,752,508
334.4 3,752,509
3,752,510

CLASS 287

2 3,752,511
20.94 3,752,512
52R 3,752,515
52.08 3,752,513
53R 3,752,514

CLASS 289

17 3,752,516
3,752,517

CLASS 292

42 3,752,518
111 3,752,519
148 3,752,520

CLASS 293

1 3,752,521
60 3,752,522
89 3,752,523

CLASS 294

25 3,752,524
74 3,752,525

CLASS 296

19 3,752,526
20 3,752,527
23R 3,752,528
24R 3,752,529
35R 3,752,530
64 3,752,531

CLASS 297

440 3,752,532
445 3,752,533

CLASS 299

10 3,752,534

CLASS 303

6C 3,752,535
21F 3,752,536
3,752,537
3,752,538
68 3,752,539

CLASS 307

9 3,753,000
10R 3,753,001
87 3,753,002
117 3,753,003
121 3,753,004
213 3,753,005
214 3,753,006
217 3,753,014
247A 3,753,007
247R 3,753,011
270 3,753,008
279 3,753,009
3,753,010
293 3,753,012

CLASS 308

4C 3,752,540
6C 3,752,541
9 3,752,542
187.2 3,752,543
3,752,544

CLASS 310

54 3,753,013
64 3,753,015
90 3,753,016
163 3,753,017

CLASS 312

13 3,752,545
35 3,752,546
107 3,752,547
140.4 3,752,548
236 3,752,549
237 3,752,550
245 3,752,551
258 3,752,552
330 3,752,553

CLASS 313

25 3,753,018
27C 3,753,025
47 3,753,019
60 3,753,020
3,753,021
78 3,753,022
103 3,753,023
217 3,753,024
318 3,753,026
3,753,027
346R 3,753,028

CLASS 315

3 3,753,029
3.6 3,753,030
5.39 3,753,031
18 3,753,032
29 3,753,033
31R 3,753,034
3,753,035
60 3,753,036
99 3,753,037
169TV 3,753,038
3,753,041
227 3,753,039
241S 3,753,040

CLASS 316

19 3,752,554

CLASS 317

11A 3,753,042
13A 3,753,043
33SC 3,753,044
62 3,753,045
101CM 3,753,046
101DH 3,753,048
107 3,753,047
3,753,049
141S 3,753,050
230 3,753,051
234R 3,753,052
3,753,053
3,753,054
3,753,056
235R 3,753,055
258 3,753,057

CLASS 318

118 3,753,058
139 3,753,059
212 3,753,061
225R 3,753,062
227 3,753,060
3,753,063
3,753,064
257 3,753,065
305 3,753,066
314 3,753,067
338 3,753,068
440 3,753,069
472 3,753,070

CLASS 320

39 3,753,072

CLASS 321

2 3,753,071
6 3,753,073
11 3,753,074
44 3,753,075
45C 3,753,077
45R 3,753,076

CLASS 322

28 3,753,080

CLASS 323

4 3,753,079
9 3,753,078

CLASS 324

.5R 3,753,081
3,753,097
6 3,753,134
16R 3,753,082
3,753,108
28 3,753,083
29.5 3,753,094
3,753,095
30C 3,753,084
37 3,753,085
40 3,753,096
51 3,753,088
52 3,753,086
3,753,087
3,753,089
53 3,753,090
54 3,753,091
61QS 3,753,099
61R 3,753,092
65P 3,753,098
65R 3,753,093
72.5 3,753,103
78D 3,753,100
96 3,753,101
103P 3,753,109
109 3,753,102
114 3,753,104
121R 3,753,105
125 3,753,106
146 3,753,107
182 3,753,110
187 3,753,111

CLASS 325

13 3,753,112
38A 3,753,113
134 3,753,118
319 3,753,121
320 3,753,114
323 3,753,115
363 3,753,116
364 3,753,117
455 3,753,119
3,753,120
466 3,753,122
476 3,753,123

CLASS 328

37 3,753,124
38 3,753,125
41 3,753,126
42 3,753,127
71 3,753,128
123 3,753,129
141 3,753,130
145 3,753,131
151 3,753,132
3,753,133

CLASS 329

106 3,753,135

CLASS 330

5 3,753,136
15 Re.27,730
3,753,137
30R 3,753,138
69 3,753,139
109 3,753,140

CLASS 331

1A 3,753,141
3,753,142
8 3,753,143
94.5G 3,753,149
94.5 3,753,144
3,753,145
3,753,146
3,753,147
3,753,148
3,753,150
3,753,152
107R 3,753,153
116R 3,753,154

CLASS 332

9R 3,753,155

CLASS 333

1.1 3,753,156
7R 3,753,157
13 3,753,158
17 3,753,159
3,753,160
23 3,753,161
24.1 3,753,162
30R 3,753,163
3,753,164
70A 3,753,169
70S 3,753,168
71 3,753,165
72 3,753,166
73R 3,753,167
81A 3,753,170
98P 3,753,171

CLASS 334

15 3,753,172

CLASS 335

1 3,753,173
47 3,753,175
112 3,753,176
132 3,753,177
135 3,753,178
207 3,753,179
272 3,753,180
274 3,753,181
281 3,753,182
284 3,753,183

CLASS 336

84 3,753,185
90 3,753,186
3,753,187
94 3,753,188
171 3,753,189

CLASS 337

21 3,753,190
112 3,753,191
201 3,753,192
331 3,753,194
347 3,753,195

CLASS 338

4 3,753,196
19 3,753,197
20 3,753,198
32H 3,753,202
42 3,753,199
3,753,200
92 3,753,201

CLASS 339

14L 3,753,203
14R 3,753,204
15 3,753,205
16C 3,753,206
17F 3,753,207
18P 3,753,208
21R 3,753,209
65 3,753,210
75MP 3,753,211
91R 3,753,212
97R 3,753,213
102R 3,753,214
136M 3,753,215
198GA 3,753,216
256R 3,753,193

CLASS 340

5R 3,753,219
8R 3,753,218
15 3,753,221
15.5HR 3,753,222
27R 3,753,220
32 3,753,223
80 3,753,224
146.1AJ 3,753,225
3,753,227
146.1AL 3,753,230
146.1C 3,753,226
146.1D 3,753,228
146.3MA 3,753,229
166EL 3,753,231
172.5 3,753,232
3,753,233
3,753,234
3,753,235
3,753,236
3,753,237
3,753,238
3,753,239
3,753,240
3,753,241
3,753,242
3,753,243
3,753,244
3,753,245
3,753,246
173LS 3,753,247
173R 3,753,248
3,753,249
174PW 3,753,251
174TF 3,753,250
3,753,253
174.1B 3,753,254
174.1G 3,753,252
174.1M 3,753,255
190 Re.27,728
227.1 3,753,256
228R 3,753,258
3,753,259
236 3,753,257
242 3,753,260
252P 3,753,261

CLASS 350

3.5 3,752,555
3,752,556
3,752,557
6 3,752,558
55 3,752,559
91 3,752,560
96R 3,752,561
113 3,752,562
151 3,752,563
160 3,753,151
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244	3,752,892	7	3,752,611	133	3,752,618	298	3,752,627		**CLASS 431**	57	3,752,641
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250	3,752,888	78	3,752,622	174.2	3,752,620	305B	3,752,629	274	3,752,637	59	3,752,639
270	3,752,893	80	3,752,613	192	3,752,621	324	3,752,631	353	3,752,634	66	3,752,642
273	3,752,889	113	3,752,614	206	3,752,623	325	3,752,630			120	3,752,456
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Frederick B. Dent, *Secretary*